THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY

A STUDY ON HEAD INJURY PATIENTS WITH GCS 15.

Dissertation submitted in partial fulfillment by the requirements for the degree of

M.Ch. Branch –II
NEUROSURGERY

Examination in AUGUST 2013

INSTITUTE OF NEUROLOGY

MADRAS MEDICAL COLLEGE

CHENNAI – 3.

CERTIFICATE

This is to certify that this dissertation entitled **"A STUDY ON HEAD INJURY PATIENTS WITH GCS 15"** is the bonafide original work of **Dr.H.Chelladurai Pandian** in partial fulfillment of the requirements for Branch II, M.Ch Neurosurgery, examination of THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY to be held in August 2013.The period of post graduate study and training was from August 2010 – August 2013.

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DECLARATION

I solemnly declare that this dissertation **"A STUDY ON HEAD INJURY PATIENTS WITH GCS 15"** was prepared by me in the Institute of Neurology, Madras Medical College and Rajiv Gandhi Government General Hospital-RGGGH Chennai under the able guidance and supervision of Professor of Neurosurgery, Madras Medical College and Rajiv Gandhi Government General Hospital-RGGGH Chennai between 2012 to 2013.

This dissertation is submitted to The Tamilnadu Dr.M.G.R. Medical University, Chennai in partial and fulfillment of the university requirements for the award of degree of M.Ch. Neurosurgery.

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CONTENTS

INTRODUCTION

INTRODUCTION

HEAD INJURY, now better known as traumatic brain injury (TBI), is a silent epidemic of current era. It mostly affects young and productive age group of people, leading to significant loss of life and economy. Head injury is classified as mild, moderate and severe head injury, depending upon the patient's level of consciousness and expressed as Glasgow Coma Scale (GCS) score. Mild head injury constitutes the majority (70% to 85%) of total patients with head injuries. The majority of patients (>90%) who were admitted are with normal or near normal level of consciousness (GCS score of 13–15) and are classified as mild head injury or Mild traumatic brain injury (mTBI).Adding LOC to the assessment, Mild traumatic brain injury is defined as any injury to the head resulting in LOC for less than 30 minutes, any alteration in mental status at the time of the accident, or amnesia.

The Neurotraumatology Committee of the World Federation of Neurosurgical Societies (WFNS)[1] proposed the term mTBI to include all types of injuries which were previously called as "minor" or "trivial". The mTBI is further classified into low, medium, and high risks based on GCS and the presence of neurological symptoms. The neurological symptoms included are LOC, PTA,

vomiting and diffuse headache. Patients with GCS 15 without any neurological symptoms are classified as "low-risk", and those with any of the above symptoms are classified as "medium-risk". Patients with GCS 14 or15 with a skull fracture or neurological deficits are classified as "high-risk". Presence of any of the following risk factors, i.e., coagulopathy, drug or alcohol consumption, previous neurosurgical procedures, pre trauma epilepsy, or age more than 60 years, also indicates high-risk irrespective of admission GCS.

European Federation of Neurosurgeons[2](EFNS) has defined and classified mTBI based on the parameters GCS, PTA or LOC, and risk factors into four categories. The risk factors include unclear or ambiguous accident history, continued post-traumatic amnesia, retrograde amnesia > 30 minutes, trauma above the clavicles including clinical signs of skull fracture, severe headache, vomiting, focal neurological deficit, seizure, age less than 2 or more than 60 years, coagulation disorders, high-energy accident { defined as initial speed >64 km/hour, major auto-deformity, intrusion into passenger compartment >30 cm, extrication time from vehicle >20 minutes, falls >6 m, roll over, auto-pedestrian accidents, or motor cycle crash >32 km/hour or with separation of rider and bike}, and intoxication with alcohol/drugs.

Patients were classified as

Category 0 - GCS 15 without LOC, PTA or any risk factors.

Category 1 - GCS 15 with risk factors.

Category 2 - GCS 15 with LOC or PTA.

Category 3 - GCS 13–14.

The most comprehensive definition is the one given by WHO Collaborating Centre Task Force[3] on mTBI .They have expanded the previous definition of mTBI as *"an acute brain injury resulting from mechanical energy to the head from external physical forces"*. Operational criteria for clinical identification include any one or more of the following:

- Confusion or disorientation,
- LOC for 30 minutes or less,
- PTA for less than 24 hours and/or other transient neurological abnormalities such as focal signs, seizure, and intracranial lesion not requiring surgery.
- GCS of 13–15, 30 minutes post-injury or later upon presentation for healthcare.

The groups at highest risk of mTBI are the younger age group, even though older adults also prone for head injury. Mild traumatic brain injury is commoner in men. The most common causes are RTAs and fall. Usually mild TBI patients are managed conservatively but an estimated 6% to 9% may have intracranial injuries and 0.4% to 1% may need neurosurgical intervention. Consequences of mild head injury can be early, life threatening complications, and long-term disability. Skull radiography is sparingly used for skull fractures and CT scan brain has taken a lead position. Computed Tomography (CT) of the head is now the investigation of choice and is available in all small cities. Computed Tomography (CT) scanning of the head is an excellent investigation to identify intracranial injury, provides a reliable diagnosis and useful to identify those patients who may require neurosurgical intervention. The liberal use of CT brain can be justified as it is widely available, provides a quick analysis, and able to manage large number of cases with head injuries.

The consequences of a positive CT scan in head injury patients are varied

1. Management plan will be altered.
2. Hospital stay will be prolonged

3. Medico legal aspects and consequences

a. A positive CT scan may convert a simple injury into a grievous one.

b. Discharging a patient without subjecting to CT scanning and consequently found to have a positive scan positive may result in risk of litigation especially in this consumer era.

Even though life threatening complications are rare in Mild TBI patients, fear of the consumer allegations has led many to do CT scan in patients with Mild TBI. This leads to increased CT usage in diagnosis.

The incidence of abnormal CT findings in mild head injuries varies in various reports ranging from 5% to 28% of which 0.76% to 8.57% required surgical interventions. Most physicians look for GCS score, LOC, mode of injury, any altered mentation to predict the intracranial lesion. But a normal clinical examination cannot rule out a clinically significant brain injury.

Various predictors of positive CT scans in mild head injury patients includes the demographic data, historical data, physical examination data and radiological data which were extensively analyzed and various guidelines were proposed by several authors to help the clinician to decide which patients need CT scan in mild head injuries.

Hence this study conducted at Dept. of Neurosurgery , Madras Institute of Neurology , to study the effectiveness of CT brain in mild head injury patients.

AIM OF THE STUDY

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1. To discuss the usefulness of CT brain in head injury patients with GCS score 15.

2. To identify the factors which may decide a positive CT brain in head injury patients.

3. To analyze the efficiency of the certain factors of Canadian CT head rule (CCTHR) and New Orleans criteria (NOC) in Indian setup.

4. To evaluate necessary neurosurgical intervention.

4. To analyze the outcome of head injury patients with GCS score 15.

REVIEW OF LITERATURE

REVIEW OF THE LITERATURE

Shack ford et al[4] (1992) in their retrospective study derived the following implications, that CT scan has to be recommended for all patients with a mTBI because one in five may have an acute lesion detectable by the scan and CT scan is mandatory for any patient with a MHI and a GCS <15, since one in three may have an acute lesion and one in ten may require craniotomy.

Stein et al[5] (1992) in their retrospective review of 1538 patients reported 7.2% of abnormalities in initial CT scan and 3.77% of patients required surgery. In patients with a GCS <14, 40% had abnormalities and 10% required neurosurgical intervention. None of these 1334 patients with normal CT scans showed subsequent deterioration and none needed surgery.

Nagy et al[6] (1999), in their prospective study of 1170 patients including patient's GCS score of 15 with LOC, detected 3.3% abnormal CT findings. In their study 1.8% had changes in therapy. Patients without obvious findings did not deteriorate. They concluded that even though the change of management is altered in small number of patients , they consider it a valuable decision to take CT brain in these patients.

Haydel et al[7](2000) in their first phase of a prospective study of 520 consecutive patients with mTBI (patients with GCS 15 and with loss of consciousness) noted that 6.9% had positive scans. Using recursive partitioning they identified all patients who had positive CT brain had one or more of these factors namely headache, vomiting, elderly people, intoxication and amnesia, external injury and seizures. In another study by Haydel et al which included 909 patients 6.3% had positive scans; the sensitivity of the factors combined was 100% (95% confidence interval).The conclusion is in mTBI CT scan needs to be taken for those who have any of the above findings. They derived a set of factors and it was called as NEW ORLEANS CRITERIA.

Vilke et al[8](2000) in their prospective study which enrolled non penetrating head trauma patients of age more than 14years with GCS 15 and with history of LOC and analyzed 58 patients and found that 5% had significant CT findings, and one patient underwent surgery. They concluded that brain injury cannot be excluded in patients with mTBI despite a GCS of 15 .

Ian G Stiell,(2001)[9] in their prospective cohort study including 3121 patients found that the mean age is 38•7 years); GCS scores of 13-(3•5%), 14-(16•7%), 15-(79•8%), 8% had clinically important brain injury; and 1% required

neurological intervention. They derived a CT head rule - CANADIAN CT HEAD RULE which consists of five high-risk factors

1. Failure to reach GCS of 15 within 2 hours ,

2. Suspected open skull fracture,

3. Any sign of basal skull fracture,

4. Vomiting – 2 episodes, and

5. Age >65 years)

They also included two additional medium-risk factors (amnesia before impact >30 min and dangerous mechanism of injury). The high-risk factors were 100% sensitive (95% CI 92–100%) for predicting need for neurological intervention, and would require only 32% of patients to undergo CT. The medium-risk factors were 98•4% sensitive (95% CI 96–99%) and 49•6% specific for predicting clinically important brain injury, and would require only 54% of patients to undergo CT.

Ibanez et al[10] (2004) in a prospective study which enrolled 1101 patients analyzed the risk factors for mild head injury with GCS 15 with or without LOC. Age >14). The intracranial lesions found in 7.5% and 1% underwent neurosurgical intervention. The head injury related mortality rate in this series was 0.4%. GCS <14, LOC, vomiting, headache, evidence of skull fracture, any neurological

deficit, coagulopathy, and hydrocephalus, any associated extra cranial lesions, and geriatric patients were identified as risk factors They concluded that clinical variables are not very useful in prediction of significant brain injury.

Khaji A et al (2006)[11] studied 1209 cases with Glasgow Coma Scale (GCS) score >13 who underwent brain CT scan. For 1209 patients, there were the following characteristics: mean age was 29.4 years; and the main cause of injury was traffic accidents (60.1%), followed by falls (28.5%), fights (7.2%), and other reasons (4.2%). 77 cases had a GCS of 13, 212 patients had GCS 14, and 920 GCS 15. A total of 481 abnormalities on CT scan were reported for 405 patients (33.5%) with positive report of brain CT scan, while 804 cases (66.5%) didn't report abnormalities. The most common intracranial lesion was extradural hemorrhage with 146 cases (30.3%). The rate of negative reporting of brain CT scan in patients with GCS 15 is 72.2%.

Bamvita JM et al[12] (2006) in their retrospective study including patients with GCS 13 to 15; no LOC ; without any fracture; a CT brain was done. There were 405 patients and CT found lesions in 12% .Three percent needed neurosurgical intervention.

13

Marion Smits et al (2007) using their study on Predicting Intracranial Traumatic Findings on Computed Tomography in Patients with Minor Head Injury: devised the CHIP Prediction Rule, by studying 6936 patients with head injury presented to the emergency departments of the participating centers. They excluded 3572 of these patients whom did not meet the inclusion criteria. Of the 3364 patients included in the study. The rule included Skull fracture, high-risk mechanism of injury, amnesia >4 hours, Seizure, Neurological deficit, Vomiting, Decrease in GCS score, and Coagulopathy. Applying this rule they predicted possibility of intracranial injury with 94 – 95% sensitivity .

14

Manessiez O et al (2007) validated some clinical criteria, which, when absent, would make it safe to bypass CT scan examination in mild cranial injuries. In their prospective study including , 285 patients with mild cranial injury with a Glasgow score of 15, had a normal clinical examination but transitory LOC or suspected transitory LOC. Of the patients studied, 7% presented an intracranial lesion and 7% a facial bone lesion. Surgical intervention needed in 0.4% of the patients .

15

Morochovic R, et al (2008) in their retrospective study of patients older than 15 years there were 151 alcohol intoxicated patients. 22.5% had any one evidence for TBI. 68.2% had no evidence of TBI, 9.3% patients had fractures only. Five (3.3%) patients were operated, 3 (2%) for fractures and 2 (1.3%) for SDH. In alcohol intoxicated patients the incidence of mTBI is 22.5% and 3.3% needed intervention.

16

Yavasi et al (2011)(16) in their retrospective study included 923 patients. CT scan was positive in 1.8 and 0.6% needed intervention. Statistically significant correlations were found among headache, presence of clinical findings of skull fracture, focal neurological deficit and positive cranial CT findings. Even though the incidence of TBI is less liberal use of computed tomography is justified.

17

Brkic et al (2011) in the study which encompassed 1830 with mTBI , basic clinical variables were recorded and a subset of patients meeting either Canadian or New Orleans criteria were subjected to CT. Outcome in terms of "positive" CT scans and number of patients requiring surgery was recorded.The mean age was 30.4 years. The conclusion was computed tomography to be done as suggested by CCTHR or NOC criteria.

Marghli S et al[18] (2012) (17) study which enrolled 1,582 patients neurosurgical intervention was performed in 34 patients (2.1%) and positive in 13.8%.Sensitivity and specificity were 100% and 60% respectively for and 82% and 26% for New Orleans Criteria (NOC). Negative predictive values for the abovementioned clinical decision rules were 100% and 99% and positive values were 5% and 2%, respectively for patients with mild head injury, the Canadian CT Head Rule had higher sensitivity than the New Orleans Criteria, with higher negative predictive value.

MATERIALS AND METHODS

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Study pattern

This study conducted at Madras Medical College and Rajiv Gandhi Govt. General Hospital , Institute of Neurology which included 5308 patients of age >16 years and with all modes of injury. All those patients were examined thoroughly examined by Neurosurgery residents and postgraduates where all patients with GCS 15 underwent CT Brain.

Inclusion criteria

All patients with GCS score of 15 irrespective of age and mode of injury who were admitted in our head injury unit were included in our study population.

Exclusion criteria

The following patients were excluded from the study ,

1. Patients who were admitted in head injury ward 24 hours after the occurrence of injury since his initial GCS could not be assessed.

2. Patients with Glasgow coma scale less than 15.

Criteria for CT scan

All patients who were admitted with the inclusion criteria were subjected for CT brain without any separate selection criteria.

In recent years for selection of patients who need CT imaging ,some guidelines were published, namely the New Orleans Criteria (NOC) and the Canadian CT Head Rule (CCHR) which are useful in identifying the usefulness of CT brain in mild head injury patients. Both are highly sensitive in detecting intracranial injuries, but specificity varies.

The purpose of this study is also to analyze certain factors which were used in Canadian CT Head Rule , the New Orleans Criteria and CHIP rule in detecting the intracranial injuries with Glasgow coma scale 15 in Indian population. Also the need for neurosurgical intervention is studied.

Canadian CT Head Rule

CT Head is only required for minor head injury patients with any one of the following findings. Minor head injury patients present with a GCS score of 13-15 after witnessed loss of consciousness, amnesia, or confusion.

High-Risk (for Neurosurgical Intervention)

1. GCS score < 15 at 2 hours after injury
2. Suspected open or depressed skull fracture
3. Any sign of basal skull fracture *
4. Vomiting ≥ 2 episodes
5. Age ≥ 65 years

Medium-Risk (for Brain Injury on CT)

6. Amnesia before impact ≥ 30 minutes
7. Dangerous mechanism **

* Signs of Basal Skull Fracture:
- hemotympanum, 'racoon' eyes, CSF otorrhea / rhinorrhea, Battle's sign

** Dangerous Mechanism:
- pedestrian struck by motor vehicle
- occupant ejected from motor vehicle
- fall from elevation ≥ 3 feet or 5 stairs

Rule not applicable if:
- Non-trauma case
- GCS < 13
- Age < 16 years
- Warfarin or bleeding disorder
- Obvious open skull fracture

Haydel et al[7] proposed New Orleans Criteria (NOC) which shows 100% sensitivity for neurosurgical lesions. Differences between the both are age cutoff of 60 years in the NOC versus 65 in the CCTHR; headache, intoxication, and seizure are criteria in the NOC; and trauma above the clavicle is a criteria of the NOC but not of the CCTHR (which includes evidence of skull fracture). Furthermore, the CCTHR includes mechanism of injury while the NOC does not. Two studies comparing the rules also found that both rules were sensitive in predicting intracranial lesions not requiring neurosurgical intervention,although one study found the CCTHR less sensitive for these (83.4% vs 98.3%). Both studies showed the CCTHR to have greater specificity and hence more ability to decrease the number of CT scans done.

NEW ORLEANS CRITERIA (NOC)

CT scan is indicated if a patient has 1 or more of the following criteria:

1. Headache
2. Vomiting
3. Age > 60 y
4. Drug or alcohol intoxication
5. Persistent anterograde amnesia (ex: deficits in short-term memory.)
6. Visible trauma above the clavicle
7. Seizure

CT Brain is required in mild head injury patients if they have any one of the above mentioned criteria.

Several prediction rules have been published since 2001, but many still require validation, including the CT in Head Injury Patients (CHIP) rule, which divides criteria into major or minor risk of intracranial lesion. The authors of the CHIP rule recognized coagulopathy as an important risk factor. (Coagulopathy was an exclusion criterion in the CCTHR, and there were not enough patients in the NOC to determine its significance.). The most sensitive predictors of intracranial hemorrhage found by the CHIP investigators were below

CHIP RULE

1. Skull fracture,
2. High-risk mechanism of injury,
3. Posttraumatic amnesia for more than 4 hours,
4. Seizure,
5. Neurological deficit,
6. Vomiting,
7. Decrease in GCS score, and
8. Coagulopathy.

Operational definitions

Positive CT scan is any scan which demonstrated any of the following

a. Extradural hematoma

b. Subdural hematoma

c. Subarachnoid hemorrhage.

d. Intracerebral hematoma

e. Intraventricular hemorrhage

f. Pneumocephalus

g. Contusion

h. Linear or depressed fractures

i. Basilar fracture

The other factors that were used in the study are ,

a) History of loss of consciousness (LOC)

Patient who were amnestic of the trauma event, gave a history of loss of consciousness or had a witnessed loss of consciousness were considered to have a positive LOC.

b) Scalp injury Defined as trauma above the clavicle and includes the lesions such as abrasions and even small lacerations and signs of facial or skull fracture.

c) Focal neurological deficit (FND)

Defined as unequal or asymmetrically reactive pupils, nystagmus, other abnormal eye movements, focal extremity weakness or Babinski's reflex, any cranial nerve involvement.

d) Seizure Suspected or witnessed seizure after the traumatic event.

e) Associated polytrauma Thoracic, abdominal, spinal cord injury or facial / limb fracture.

f) Vomiting Any emesis after the traumatic event.

The following factors were studied and analyzed descriptively and statistically, whether they could prove as positive predictive factors / risk factors:

I. Demographic data

a. Age

b. Sex

c. Mode of injury

II. Historical data

a. Headache

b. LOC

c. Post traumatic seizure

d. ENT bleed

e. Vomiting

f. Watery discharge from ear / nose.

g. Any H/o alcohol intake?

III. Physical examination data

a. Scalp injury

b. Associated polytrauma

c. Focal neurological deficit

IV. Radiological data

a. CT Brain.

Following were the intervention and outcome profiles studied and analyzed

a. Surgical interventions.

b. Length of hospital stay.

c. Late complications.

d. Deterioration.

e. Discharge GCS score.

f. Residual neurological deficit.

g. Systemic vegetative symptoms.

h. Death.

RESULTS

RESULTS

The following were the results of the study population.

Total number of patients admitted in the trauma ward in the past six months for head injuries were 5308,out of which 3536 patients presented with GCS 15 which corresponds to 66% of the total population.

Total patients admitted

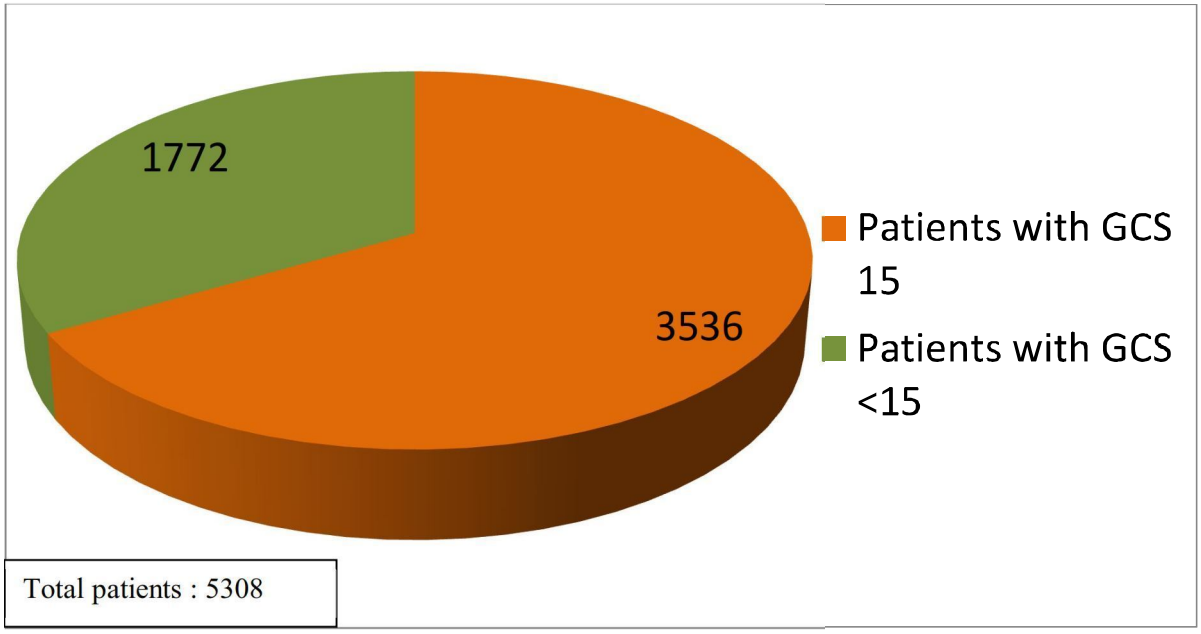


Chart -1

Total patients with GCS 15:

- All the patients with GCS 15 underwent CT brain, Out of the total 5308 patients 455 patients had one or more findings in CT Brain.

Patients with findings in CT correspond to 12.86 % of the total population.

Total patients with GCS 15

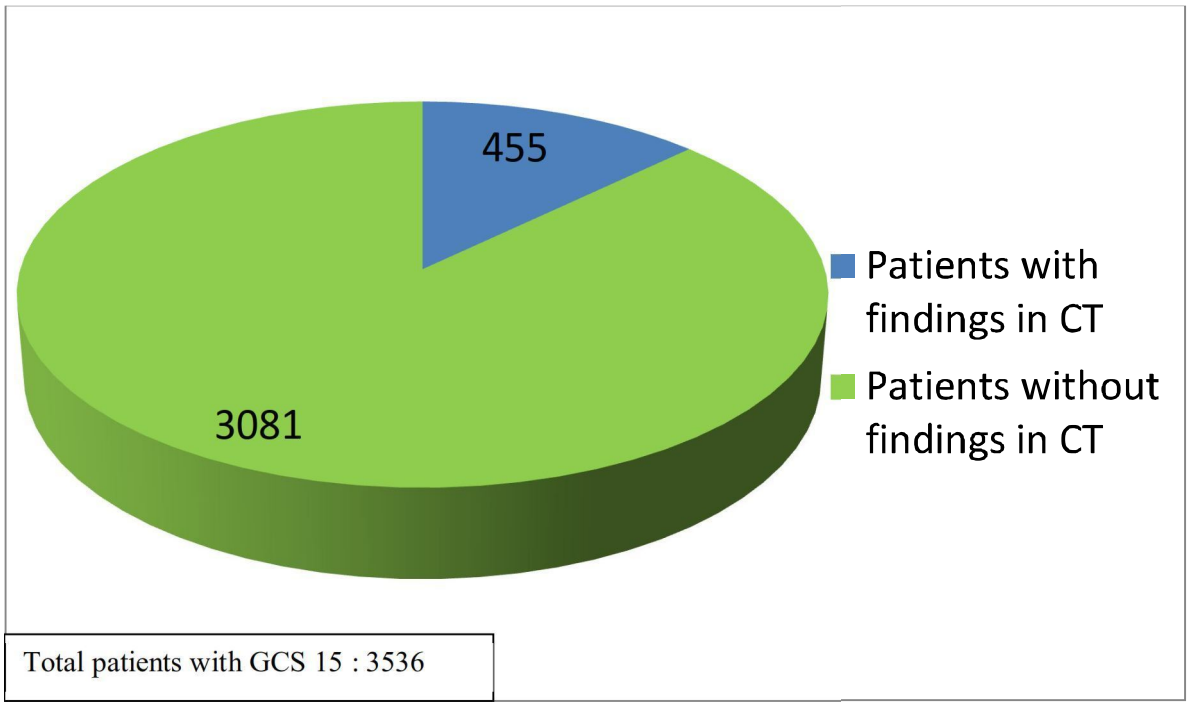


Chart - 2

1) Sex as a predictive factor for positive CT scan:

The total number of males is 383 – 84 %

The total number of females is 73 – 16 %

Sex was analyzed using chi square test and N-Par tests. Taking sex as a predictive factor for positive CT scan in head injured patients with GCS 15 was found to be statistically significant (p<.001**).

Sex Distribution

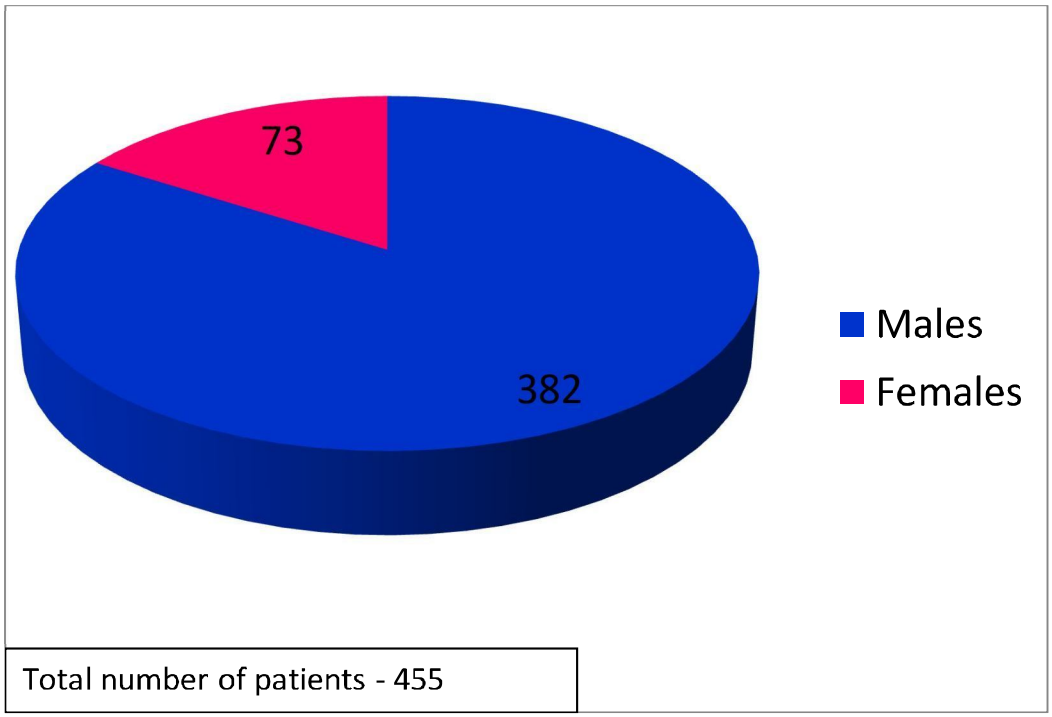


Chart - 3

Male patients were more prone to have positive CT brain than female patients(because males constituted largest number in the study group).

SEX	FREQUENCY	PERCENTAGE	P VALUE
MALE	382	84.0	
FEMALE	73	16.0	**<0.001****
TOTAL	455	100	

Table - 1

b) Age Distribution

The study population was analyzed for age distribution and described as below

Age Gp	Patients	Percentage
16 – 20	46	10.1%
21 – 30	138	30.3%
31 – 40	102	22.4%
41 – 50	81	17.9%
51 – 60	48	10.5%
61 – 70	30	6.6%
>70	10	2.2%

Table -2

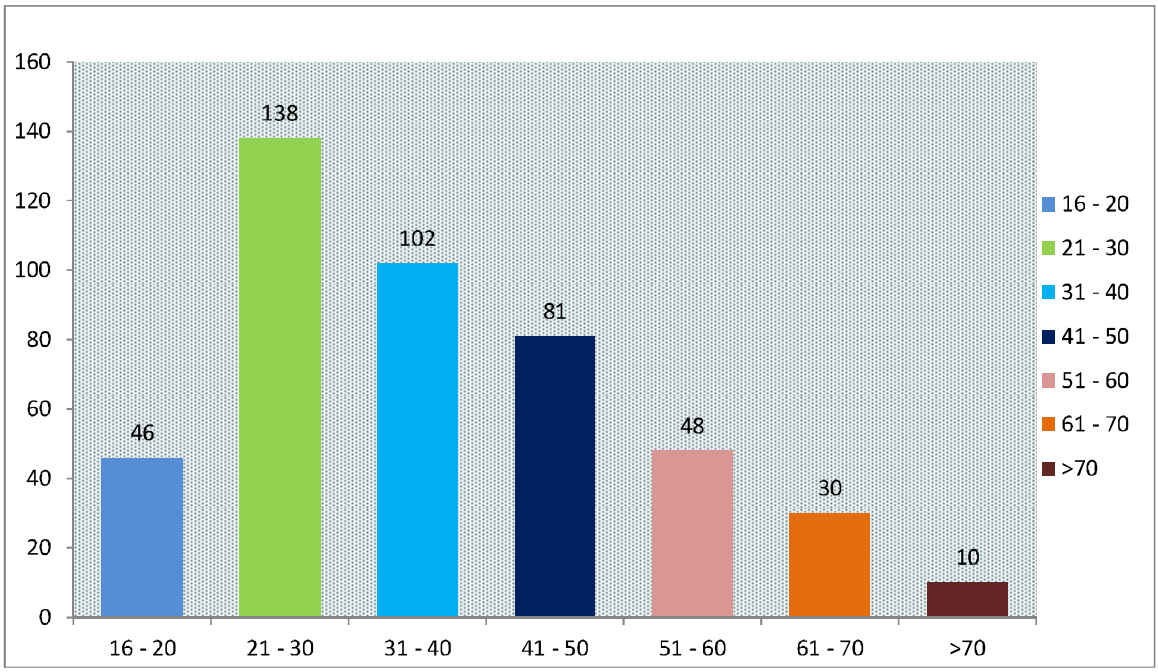


Chart - 4

When different ages were analyzed using chi square test as a predictor of positive CT scan in head injured patients with GCS 15 it was found to be statistically not significant (p = 0.78).Head injury more common in younger age group in the second and third decade since they were the people who frequently travel for education and job purpose.

c) Mode of Injury:

The most common mode of injury was RTA – 281 patients – 61.8%

Next common mode of injury is Fall – 134 patients – 29.5%

Followed by Assault – 35 patients – 7.5 % and

The least common mode was Fall from train – 6 patients – 1.3%

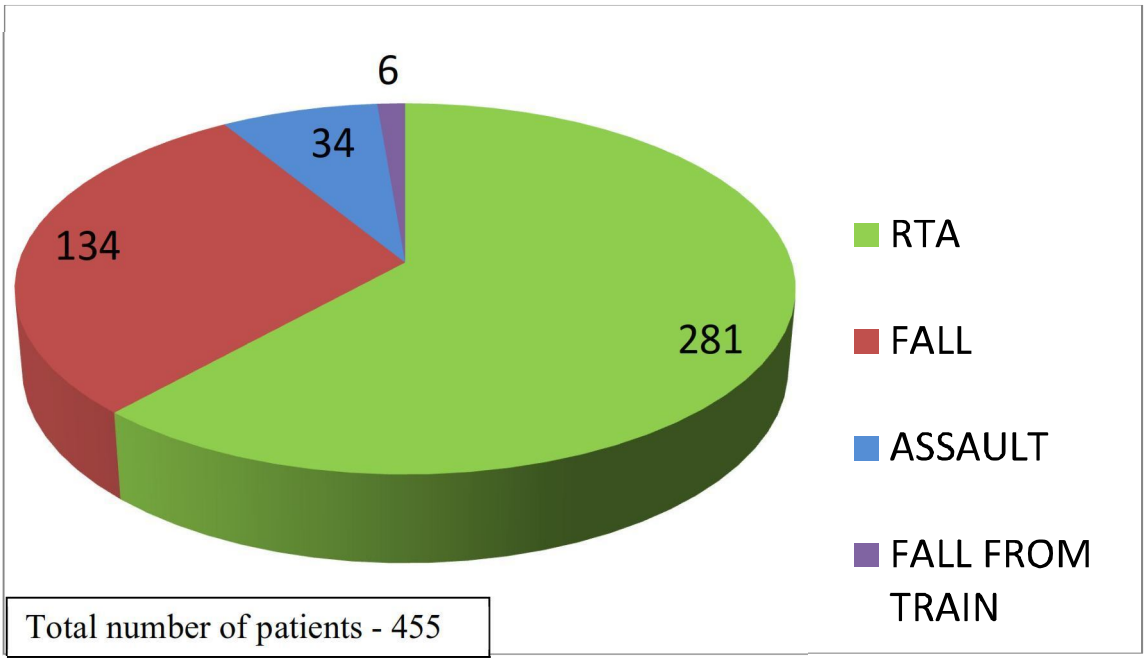


Chart -5

RTA was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Applying chi square test and N-Par tests ,which revealed that RTA was found to be statistically significant contributing factor. (p<.001**).

Mode of Injury

MODE OF INJURY	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
RTA	281	61.8	61.8	61.8	
ASSAULT	134	29.5	29.5	91.2	
FALL	34	7.5	7.5	98.7	**<0.001****
FALL FROM TRAIN	6	1.3	1.3	100.0	
TOTAL	455	100	100		

Table - 3

4) CT Findings

The CT findings from the analyzed data were tabulated as below,

CT Findings	Patients	Percentage
Contusion	115	25.2%
EDH	42	9.2%

SDH	50	11%
IVH	1	0.2%
Fracture	176	38.7%
SAH	47	10.3%
Multiple	24	5.3%

Table - 4

CT Findings

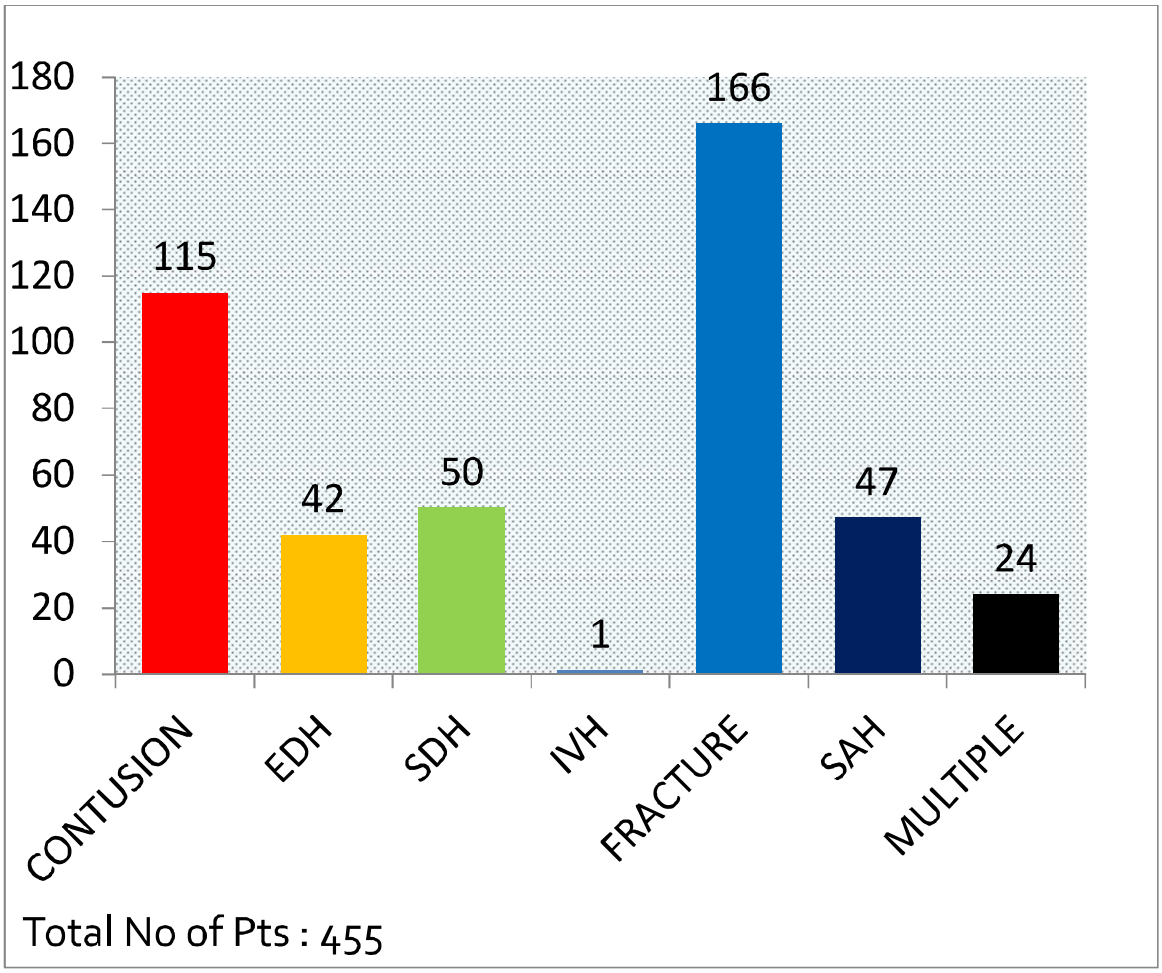


Chart - 6

The most common findings are Fractures and Contusions , which contributes to 62% of the findings.

5) Alcoholic influence as a predictor of positive CT scan

ALCOHOL	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	380	83.5	83.5	83.5	**<0.001****
PRESENT	75	16.5	16.5	100.0	
TOTAL	455	100	100		

Table - 5

Alcoholic influence was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Using chi square test and N-Par tests were used and alcohol was found to be a statistically significant factor (p<.001**).

6) Headache as a predictor of positive CT scan

HEADACHE	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	70	15.4	15.4	15.4	**<0.001****
PRESENT	385	84.6	84.6	100.0	
TOTAL	455	100	100		

Table - 6

Presence of headache was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Using chi square test and N-Par tests headache was found to be statistically significant (p<.001**).

7) LOC as a predictor of positive CT scan

LOC	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	269	59.1	59.1	59.1	**<0.001****
PRESENT	186	40.9	40.9	100.0	
TOTAL	455	100	100		

Table - 7

Presence of LOC was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Using chi square test and N-Par tests LOC was found to be statistically significant (p<.001**).

8) Seizures as a predictor of positive CT scan

SEIZURES	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	434	95.4	95.4	95.4	**<0.001****
PRESENT	21	4.6	4.6	100.0	
TOTAL	455	100	100		

Table - 8

Presence of seizures was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Using chi square test and N-Par tests seizures was found to be statistically significant (p<.001**).

9) Vomiting as a predictor of positive CT scan

VOMITING	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	304	66.8	66.8	66.8	**<0.001****
PRESENT	151	33.2	33.2	100.0	
TOTAL	455	100	100		

Table - 9

Presence of vomiting was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Using chi square test and N-Par tests vomiting was found to be statistically significant (p<.001**).

10) ENT Bleed as a predictor of positive CT scan

Presence of ENT Bleed was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Using chi square test and N-Par tests ENT bleed was found to be statistically significant (p<.001**).

ENT BLEED	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	404	88.8	88.8	88.8	**<0.001****
PRESENT	51	11.2	11.2	100.0	
TOTAL	455	100	100		

Table - 10

11) CSF Leak as a predictor of positive CT scan

CSF LEAK	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	427	93.8	93.8	93.8	**<0.001****
PRESENT	28	6.2	6.2	100.0	
TOTAL	455	100	100		

Table - 11

Presence of CSF Leak was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Using chi square test and N-Par tests CSF Leak was found to be statistically significant (p<.001**).

12) Presence of External injury as a predictor of positive CT scan

EXT INJ	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	388	85.3	85.3	85.3	**<0.001****
PRESENT	67	14.7	14.7	100.0	
TOTAL	455	100	100		

Table - 12

Presence of External injuries was analyzed as a predictive factor in predicting positive CT brain in head injured patients with GCS 15. Applying chi square test and N-Par tests External injury was a statistically significant factor (p<.001**).

13) Absence of symptoms in positive CT scan

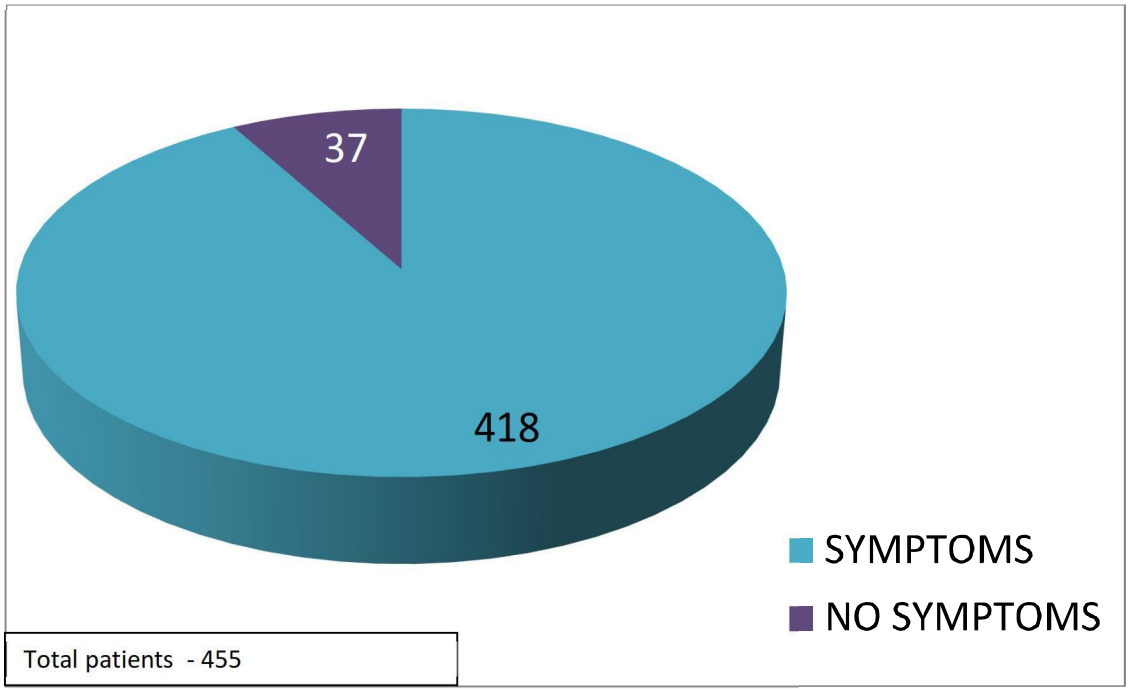


Chart -7

SYMP	FREQUENCY	PERCENTAGE	VALID %	CUMULATIVE%	P VALUE
ABSENT	37	8.1	8.1	8.1	**<0.001****
PRESENT	418	91.9	91.9	100.0	
TOTAL	455	100	100		

Table -12

Out of the 455 patients who had positive CT scan 37 patients had **no symptoms**

It corresponds to 8.1% of the study population

Out of the 37 patients

- Fractures - 27
- Contusion – 5
- EDH - 1
- SDH – 3 SAH – 1

Even without symptoms CT picked up 37 patients in a CT population of 455 and GCS 15 population of 3536 patients.

Management:

The CT findings and management are described below,

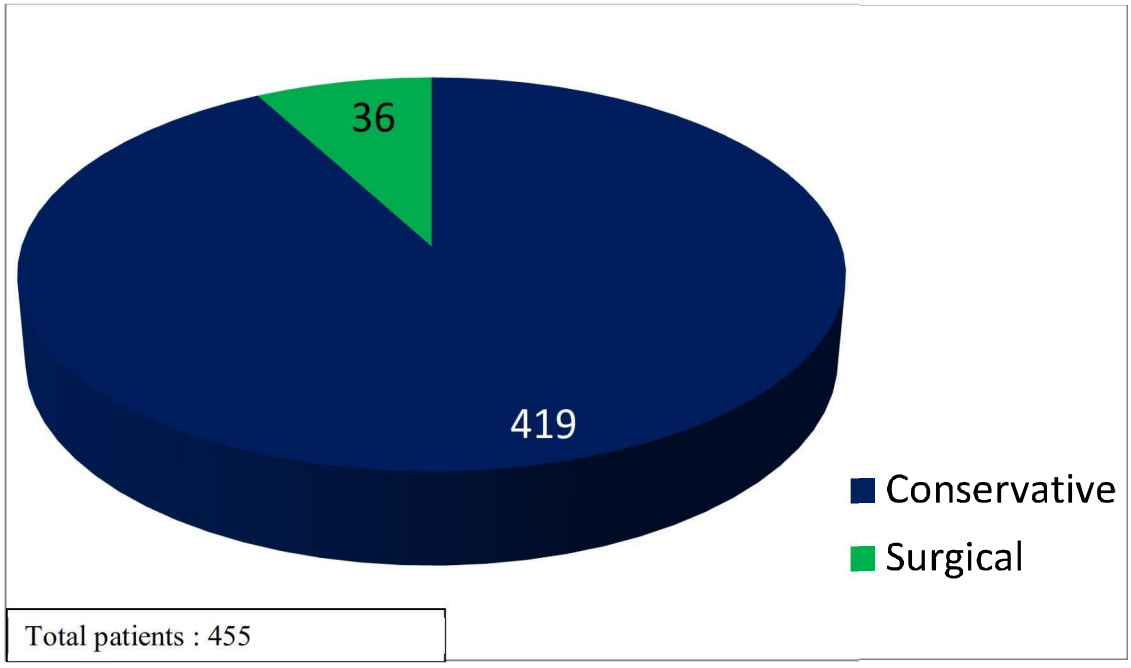


Chart - 7

The total patients admitted with GCS 15 and were operated corresponds to 0.9% compared to total population of patients with GCS 15.The details of the surgical intervention are as below,

Operated Findings

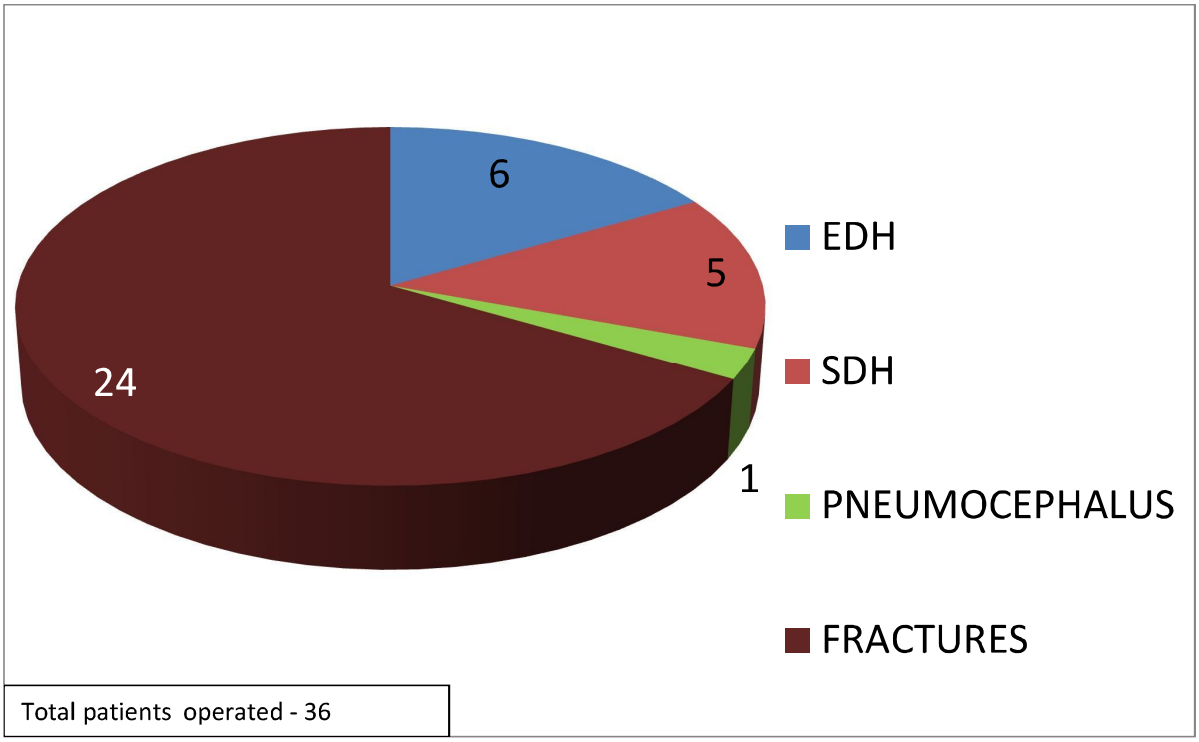
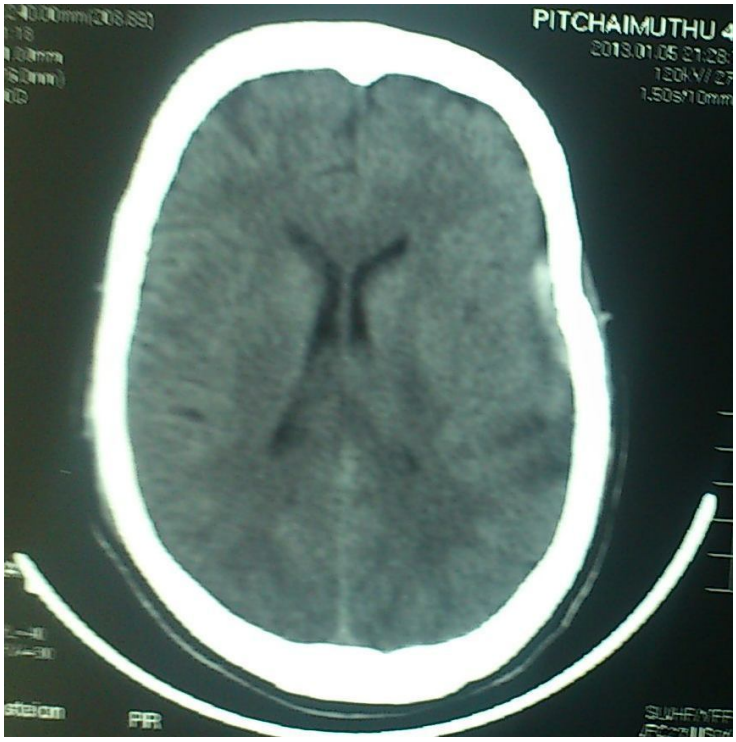


Chart - 8

Out of the 27 patients of depressed fractures 1 was a compound depressed fracture which was operated.

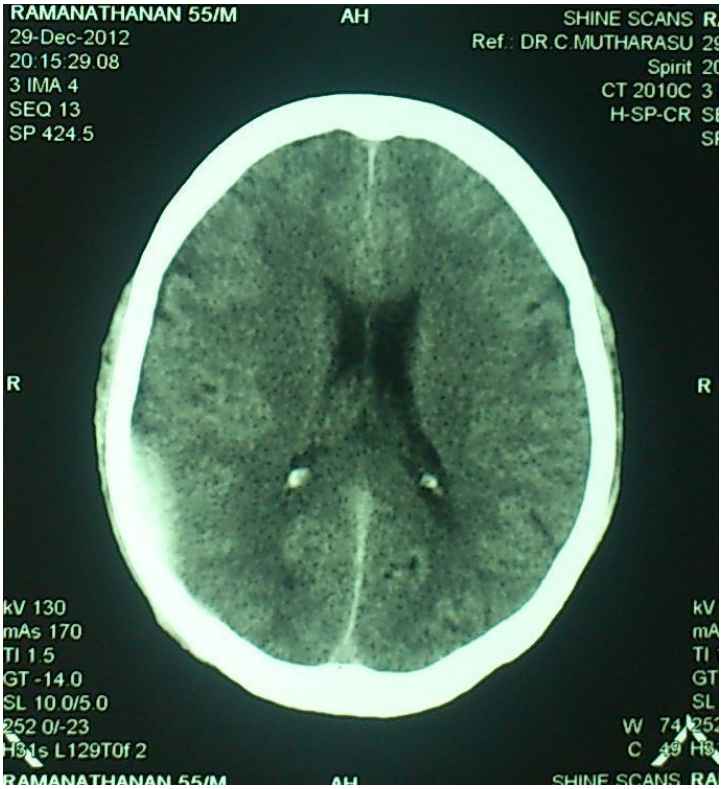
One case of EDH which had no symptoms was admitted for observation and patient developed symptoms on third day and patient was operated.

In this study no patients deteriorated who were admitted with normal neurological status , and no death occurred.



GCS 15 WITH THIN SDH

PNEUMOCEPHALUS WITH GCS 15

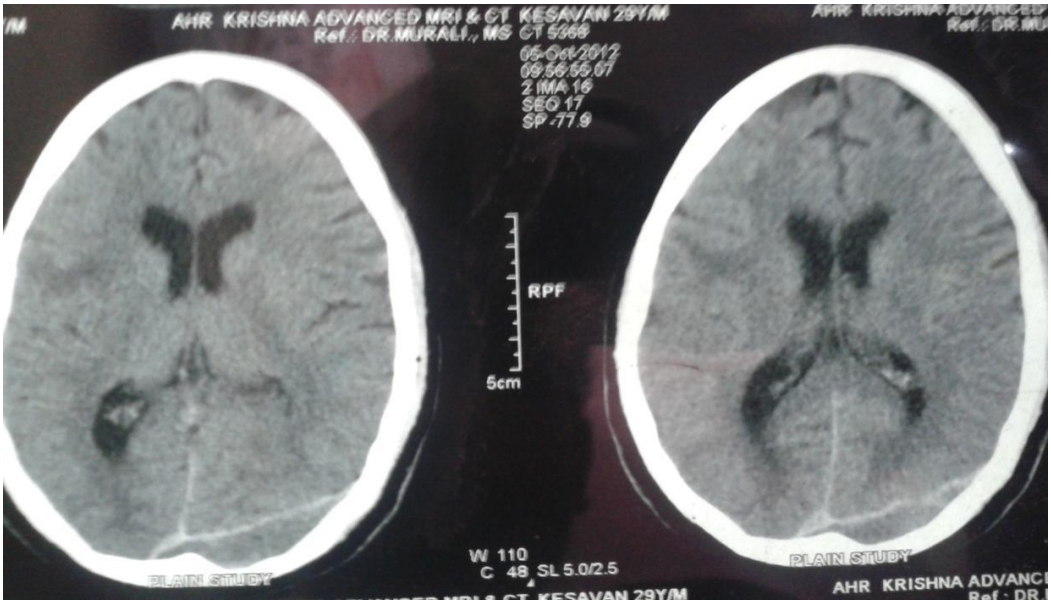


PATIENTS WITH GCS 15 AND THIN EDH

SAH WITH GCS 15

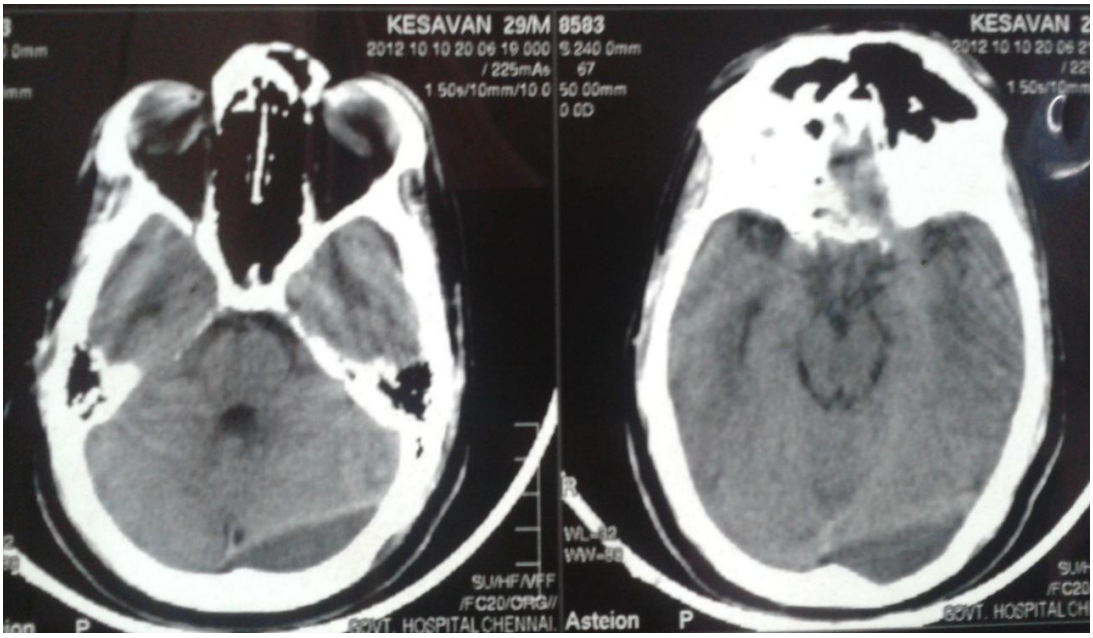
SAH WITH GCS 15

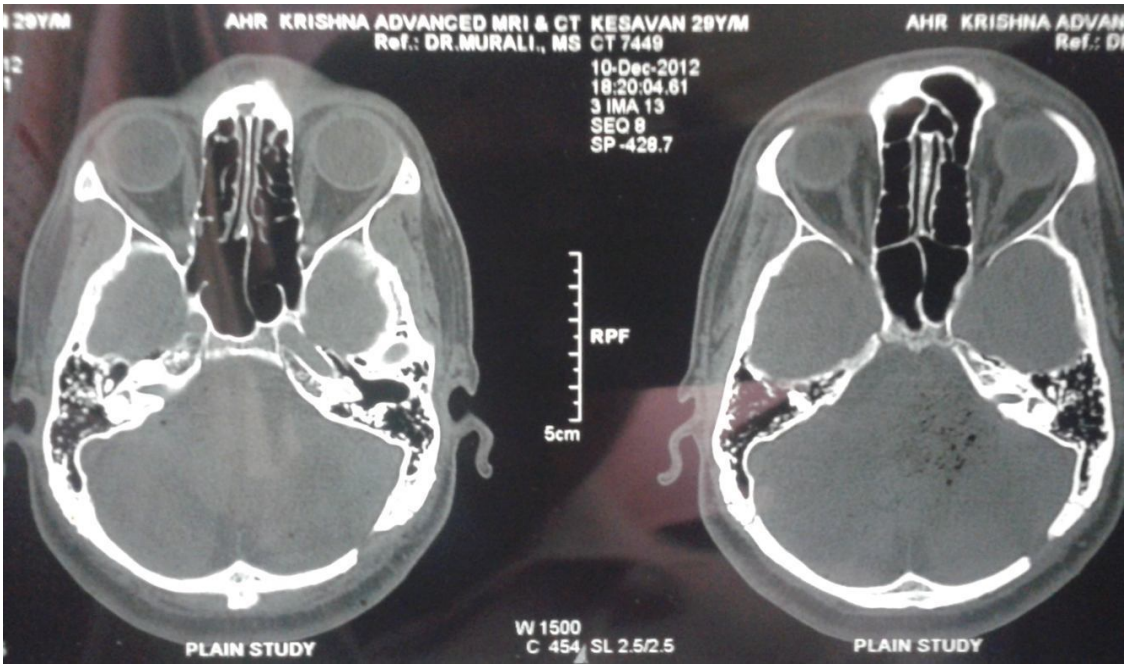
IVH WITH GCS 15



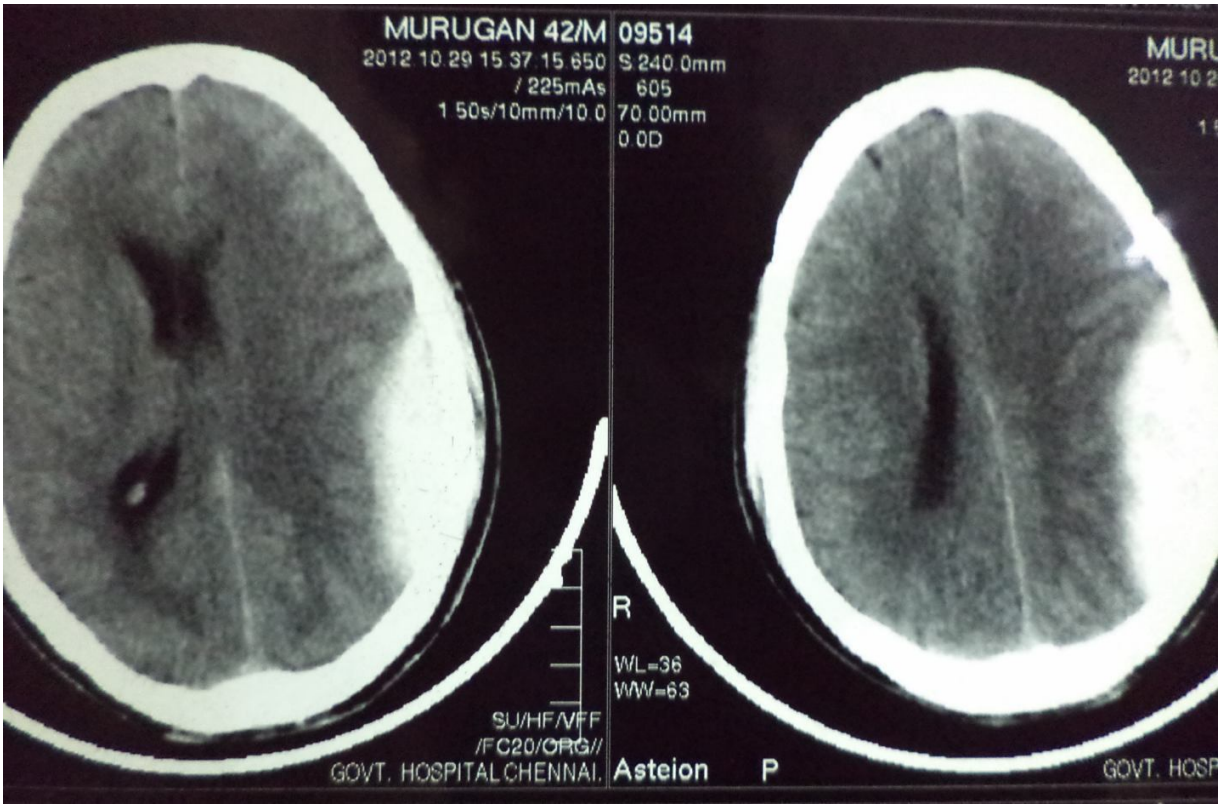
This patient had headache following a RTA presented with a CT done outside which showed thin extradural collection Patient admitted and observed.

This patient headache increased in severity , repeat CT showed increase in size of the EDH for which patient was operated

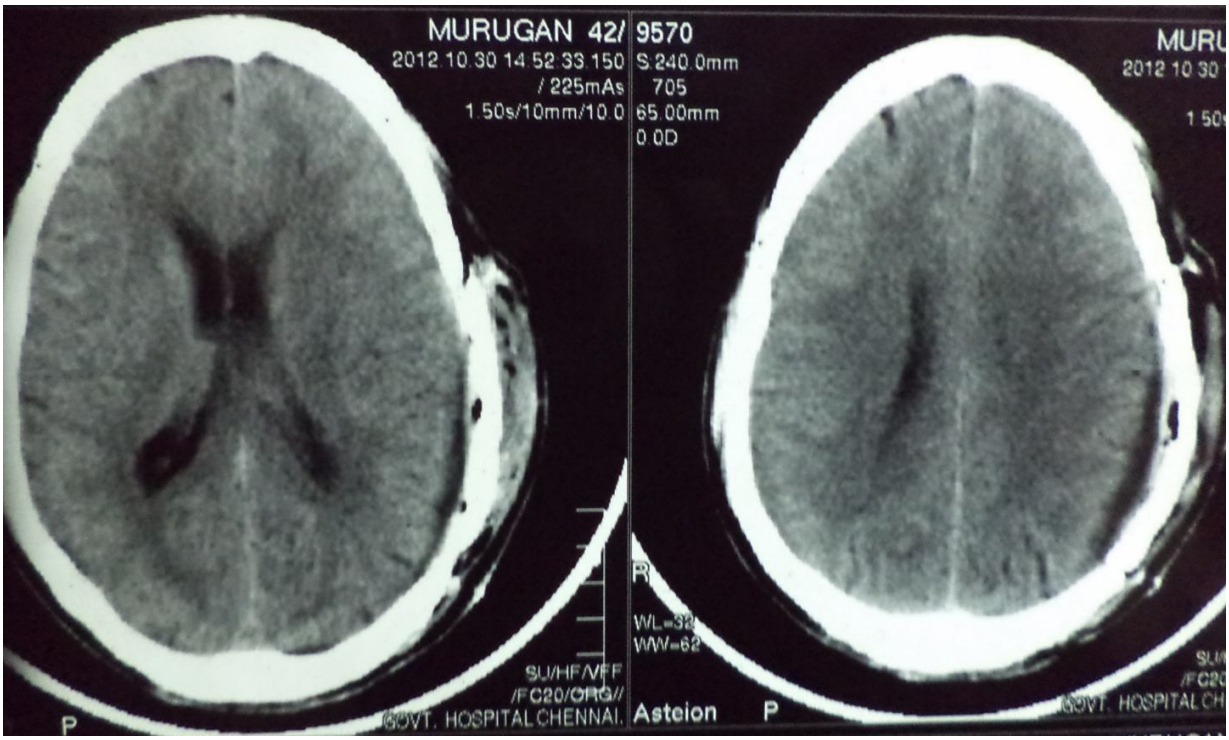


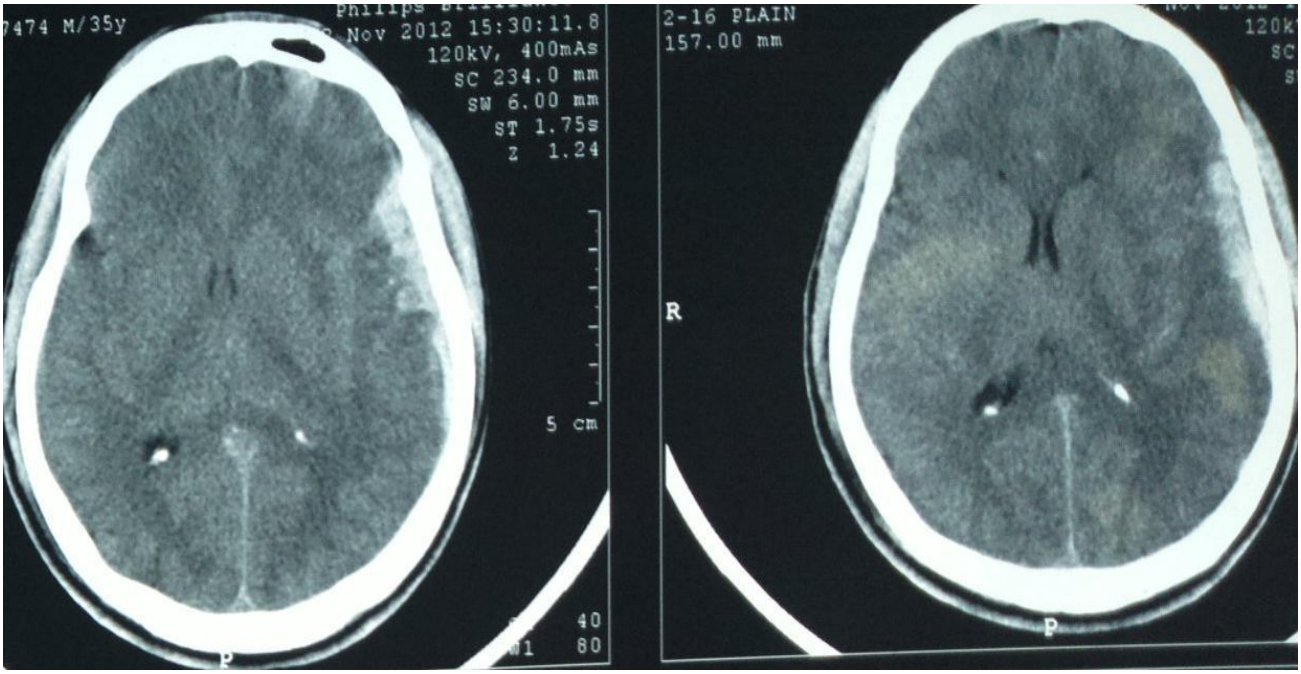


The postop CT of the patient mentioned above shows post craniotomy status.

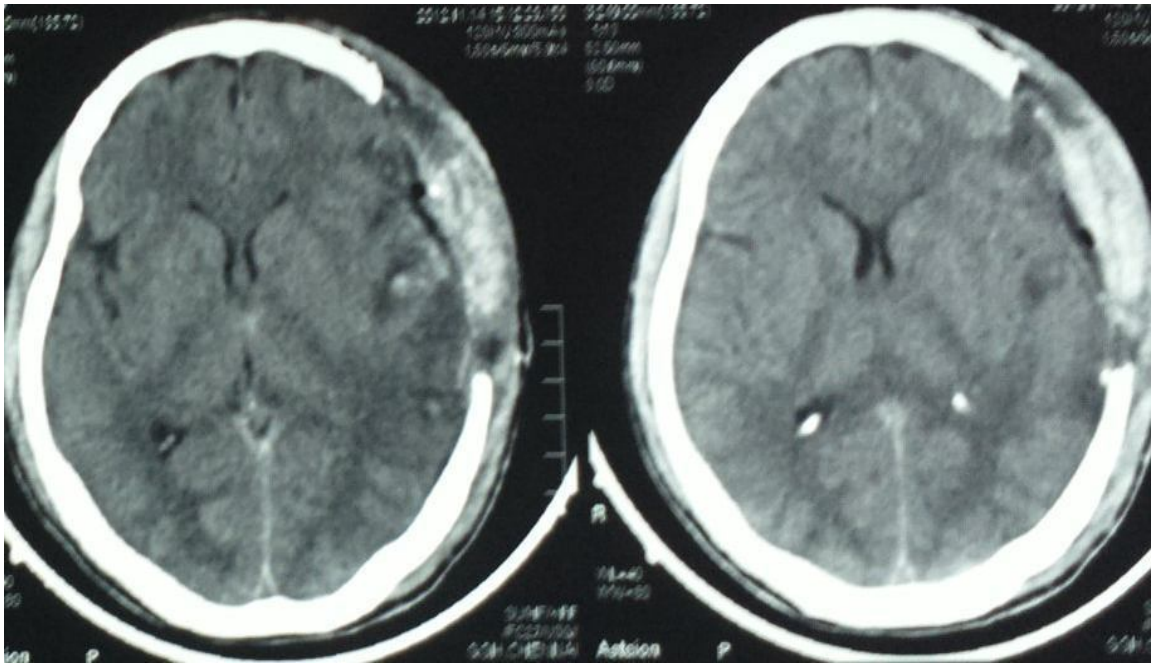


This patient a case of EDH with GCS 15 who was admitted, operated.The preop and postop images are presented here.





This patient admitted with GCS 15 and acute SDH was admitted and patient was operated for temporoparietal craniotomy and evacuation of subdural hemorrhage.



DISCUSSION

DISCUSSION

Prior to the advent of modern diagnostic neuroimaging, mild head injury was believed to be reversible or transient. Because of the mild nature of the injury the confirmatory diagnosis was made only in some cases in which mortality was attributable to co-morbid disease.

All patients with head injury with GCS 15 were subjected to CT brain without any historical or clinical criteria. The results were evaluated and assessed on the following perspective.

1. To discuss the usefulness of CT brain in head injury patients with GCS score 15.
2. To identify the factors which may decide a positive CT brain in head injury patients.
3. To compare the effectiveness of Canadian CT head rule (CCTHR) and New Orleans criteria (NOC) in Indian setup.
4. To evaluate necessary neurosurgical intervention.
5. To analyze the outcome of head injury patients with GCS 15.

6. Whether any of the demographic data (age, sex, mode of injury), historical data (history of loss of consciousness, post traumatic seizure, ENT bleed, vomiting), physical examination data (scalp injury, associated polytrauma, focal neurological deficit), head injury patients with GCS 15 could predict a positive CT scan.

7. The neurosurgical intervention required in patients with positive CT scan.

8. Medico legal implications of positive CT scans in head injured patients with GCS 15.

10.Economic advantage of preventing unnecessary CT scan in head injured patients with GCS 15.

Of all head injured hospitalized patients, those with mild head injury predominate, it constitutes 80 to 85 percent of the group worldwide. In our study this was 67%. The incidence is higher in males, our study also confirm the higher incidence in males with an incidence of 84%. The male: female ratio in our study is 5.2:1. In most of the studies Road Traffic Accident was the most common mode of injury. In our study also road traffic accident constituted 61.8% followed by assault (29.5%) accidental fall (7.5%) and fall from train (1.3%).

Despite more than two decades of debate and study, the evaluation of mild head injury patients remains controversial. CT scan is now the mainstay in the diagnostic workup. Our approach was to subject, all the patients with GCS score of 15, admitted in our trauma ward to scan the brain irrespective of age, sex and mode of injury or neurological status.

Most physicians rely on clinical criteria such as GCS, LOC, mode of injury, or changes in mentation to predict the probability of intracranial lesion.

This has led some authors to recommend liberal use of CT scanning in patients with a Glasgow coma scale < 15 or a history of a significant mechanism of injury. This study was undertaken to detect and to analyze the indication for CT scanning in head injured patients with GCS 15.

According to Haydel et al[7] those patients who had minor head injury (patients with Glasgow coma scale 15, normal neurological examination but with history of loss of consciousness) noted that 6.9% had positive scans. But in our study we included all patients with Glasgow coma scale 15 with or without loss of consciousness. 12.86 percent of our study group had positive CT brain.

Using N-par tests and Chi-square tests we derived a set of factors which identified patients who had positive CT brain and they were LOC, headache, vomiting, seizures, alcohol intoxication, deficits in short term memory, external injury and CSF leak., which were statistically significant in predicting positive CT brain.

According to Lee et al in their prospective study of mild head injury patients of age more than 16years with GCS 15 with one or more of the following where, 1.5% of mild head injury patients deteriorated after head injury, 1.3% of patients required surgical intervention. In our study head injury patients with Glasgow coma scale of 15 of all age groups with or without loss of consciousness were included and 1% of our study population required surgical intervention and none of our patients deteriorated.

As per Vilke et al in their prospective study which included head trauma patients of age more than 14years with history of loss of consciousness. In their study 5% had positive scan, only one patient underwent neurosurgical intervention. In our study head injury patients with Glasgow coma scale of 15 and age >14 with or without LOC were included showed positive CT scan Brain in 12.86 percent of our study group and 1% required surgical intervention.

They concluded that significant brain injury and need for CT scanning cannot be excluded in patients with minor head injury despite a GCS score of 15 and a normal complete neurological examination on presentation.

According to Nagy et al[6] patients who had Glasgow coma scale of 15 with loss of consciousness, detected 3.3% abnormal CT findings. 1.8% had changes in therapy as a direct result of their CT results, including 4 operative procedures. No patient with a negative CT results deteriorated which was also noted in our study. In our study the positivity of CT findings in mild head patients is 12.86%. They concluded that CT is useful test in patients with mild head injury, since it may lead to a change in therapy in a small but significant population .

In another study Stein et al[5] noted 8% had clinically important injury on CT, 4% had clinically unimportant injury on CT. In our study 6% had unimportant injury punctate contusions and linear fractures while remaining 6% had clinically significant injury. One percent of the study group required neurosurgical intervention which is similar to our study.

Our study is different from the other studies in the following aspects

1. Both retrospective and prospective study.

2. All adult patients with GCS 15 were included.

3. Patients with GCS 15 with and without loss of consciousness were included.

4. No historical or clinical criteria were used to select the patients for CT scan.

1. Incidence of positive CT scan in various settings

In the total study population (n=5308) = 12.8%

In male patients = 84%

In female patients = 16%

Patients with history of RTA = 61.8%

Patients with history of assault = 29.5%

Patients with history of accidental fall = 7.5%

Patients with history of fall from train = 1.3%

Patients with LOC = 40.9%

Patients with seizure = 4.6%

Patients with ENT bleed = 11.2%

Patients with vomiting = 33.2%

Patients with scalp injury = 14.7%

Patients with CSF leak = 6.2%

Patients with out any symptoms = 8.1%

2. Predictors of positive CT scan

The various factors of demographic data (age, sex, mode of injury), historical data (history of LOC, post traumatic seizure, ENT bleed, vomiting), Physical examination data (scalp injury, CSF leak , ENT bleed were analyzed by chi square test, p value of each factor seen. The factors which were statistically significant to identify positive CT brain were as follows

- ❖ Headache
- ❖ Loss of consciousness
- ❖ ENT bleed
- ❖ CSF leak
- ❖ Vomiting
- ❖ Mode of injury
- ❖ Alcohol influence
- ❖ External injuries

We analyzed these factors in concordance with Canadian CT head rule and New Orleans Criteria and found that these factors are statistically significant risk factors for positive CT brain. If any one of the above risk factors was present in a patient with admission GCS 15, CT scan should be advised to rule out any intracranial injury.

3. Neurosurgical intervention

Of the 3536 patients, 455 had positive CT brain, 36 of them underwent neurosurgical intervention. 24 patients were operated for compound depressed fractures, 6 cases underwent craniotomy for evacuation of extradural hematoma, five cases of SDH were operated, one case was done burr hole for evacuation of Pneumocephalus. Our study reports the incidence of neurosurgical intervention in head injured patients with GCS 15 as 1 % of non-selective consecutive population.

4. Duration of hospital stay

In our study the average duration of hospital stay of patients in the study group was 3.3 days. The duration of hospital stay for patients with positive CT scans is prolonged.

The factors that prolonged the hospital stay were:

i. Requirement of close observation and serial neurological examination.

ii. Surgical intervention

iii. For the purpose of follow up CT scan

iv. Anticipation and management of complications

v. Institution of aggressive medical therapy

vi. Management of injuries, other than head injury.

5. Safe discharge of patients

All patients in our study underwent CT scanning. 12.8 % had positive CT scans and 87.2% had negative CT scan.

Value of positive CT scan

A patient with a initial positive scan was closely observed, neurologically examined serially, aggressive medical therapy instituted appropriately, surgically intervened when necessary, follow up CT scan was done as and when required and discharged after ascertaining improvement or ascertaining negligible chance of further deterioration and with specific instructions regarding future follow up regarding medications, rehabilitation and awareness of warning signs and symptoms of deterioration.

Value of negative CT scan

The high incidence of negative CT scans in the population of head injury patients with GCS 15 as reported in our study and other similar studies might appear to be an over enthusiastic and cost intensive way of investigation with patients with MHI. However, as noted in our study and in other studies negative CT scans in MHI have the following advantages. As no patient in our study and in other studies with negative CT scan deteriorated, these patients with negative CT scan can be safely discharged home. This saves valuable hospital resources and better utilization of the available for more

severely head injured patients especially in resources scarce country like India, where hospital service are stretched to their limits. More important, a normal CT scan and neurologic examination can accurately triage the patients who can be safely discharged from the emergency department. This approach enabled them more than 80% of all patients sustaining head injury to be discharged, thus allowing better utilization of limited physician, nursing and hospital resources.

Our data and other similar studies conclusively demonstrate that patients with a CT scan, that shows no intracranial injury, and who do not have systemic injuries or a persistence of any neurological finding can be safely discharged from the emergency department without a period of either prolonged inpatient or outpatient observation. Livingstone et al recommends that, implementation of this practice could result in a potential decrease of more than 500,000 hospital admission annually in USA. In developing country like India, where hospital services are stretched to their limits, this is much more important.

6. Medico legal implications of a positive CT scan

As mentioned earlier, the medico legal implications of a positive CT scan are as follows:

i. Positive CT scan can convert a simple injury into a grievous one.

ii. Discharging patient without subjecting to CT scanning and if the patients is found to have a positive CT scan subsequently, may result in risk of litigation, especially in this consumer era.

In this study group of head injury patients with GCS 15 , there were no neurological deterioration and none of the patients with normal CT findings deteriorated.

CONCLUSION

CONCLUSION

In our study we have analyzed the risk factor which are statistically significant in predicting positive CT brain in head injury patients with admission GCS 15.

Incidence of positive CT in our consecutive, non-selective population of 3536 patients with admission GCS of 15 was 12.8%. which indicate that mTBI patients with GCS 15 may still have a significant CT finding and the line of management can change.

1. Operative neurosurgical intervention was required in 1% of our study population.

2. The following risk factors which were statistically significant in our study were:

- Headache
- Loss of consciousness
- ENT bleed
- CSF leak
- Vomiting

- Mode of injury
- Alcohol influence
- External injuries

They predict the possibility of an abnormal CT findings in head injury patients with GCS 15.

3. Patients with

a. Admission GCS of 15

b. Normal neurological examination

c. Normal CT

can be safely discharged without need for admission or observation.

4. mTBI patients with GCS score of 15 and normal CT Brain can be discharged safely from the emergency rooms , and there with the hospital care cost and manpower utilization can be significantly reduced especially in Government institutions where the resources are limited.

5. The medico legal implications of a positive CT scan are as follows; a positive CT scan can convert a simple injury in to a grievous one; discharging a patient without subjecting to CT scanning and if that patient is found to have positive CT scan subsequently may result in risk of litigation, especially in this consumer era. Routine CT scan of brain in mTBI patients saves the patients from complications and also doctors from the medico legal litigations.

PROFORMA

INSTITUTE OF NEUROLOGY
GOVERNMENT GENERAL HOSPITAL, CHENNAI
PROFORMA
"ANALYSIS OF HEAD INJURY PATIENTS WITH GCS 15"

Serial No:

Name: Age: MIN No: I.P. No:

Sex: M / F

Time interval between injury and admission:

Mode of Injury: RTA / Fall /Assault / Others

Alcohol intoxication : Present / Absent

History

History of loss of consciousness (LOC): Present / Absent

LOC in minutes:

History of vomiting: Present / Absent – No. of episodes:

– Contents : Food matter/Blood .– Projectile/Non projectile

History of seizure – Present / Absent

Type of seizure – Generalized / Focal – No. of episodes

History of Ear, Nose, Throat bleeding : Present / Absent

History of memory disturbances :Present / Absent

On examination

Admission Glasgow coma scale : 15

Scalp Injury :Present / Absent

Polytrauma :Present / Absent

Higher function examination: Normal / Abnormal

Cranial nerve examination: Present / Absent

Spino motor system: Normal / Abnormal

Sensory system: Normal / Abnormal

Cerebellar functions: Normal / Abnormal

Cardiovascular and respiratory system: Normal / Abnormal

Other systems

Investigations

CT brain :

Cerebral contusion

Pneumocephalus

Depressed fracture

Epidural hematoma

Subdural hematoma

Intracerebral hematoma

Subarachnoid hemorrhage

Management

Surgery or conservative management

Surgery :

Done on :

Outcome

Any focal neurological deficit:

Any deterioration

Any death:

Total number of days as in patient:

Discharge Glasgow coma scale

ABBREVATIONS USED IN MASTER CHART

1. Alcohol

   0 – Not under influence
   1 –Under influence.

2. Headache

   0 – No headache
   1 – Headache.

3. LOC

   0 – No LOC
   1 – LOC present.

4. Seizures

   0 – No Seizures
   1 – Seizures present.

5. Vomiting

   0 – No vomiting
   1 – Vomiting present.

6. ENT Bleed

   0 – No ENT bleed
   1 – ENT bleed present.

7. CSF Leak

0 – No CSF Leak.
1 – CSF Leak present.

8. External injuries

0 – No External injuries.
1 – External injury present.

9. Symptoms

0 – No Symptoms
1 – Any one symptom present.

10. Multiple

0 – Single lesion
2 – Multiple lesions.

11. Management

C – Conservative
S – Surgery done.

12. Outcome

D -- Discharged in stable condition.

13. GCS – Glasgow Coma Scale.

14. PTA – Post traumatic amnesia

15. LOC – Loss of consciousness.

16. CT Computerized Tomography.

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BIBLIOGRAPHY

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MASTER CHART

S.No	NAME	Age	SEX	MIN No	MODE OF INJURY	ALCOHOL	HEADACHE	LOC	SEIZURE	VOMIT	INCENT	BLEED	CSF LEAK	EXT INJ	NO SYMP	CT FINDINGS	MULTIPLE	MANAGE	OUTCOME
1	SELVAMANI	50	M	12369	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL	0	C	D
2	YUVRAJ	26	M	12401	RTA	0	1	0	0	0	0	1	1	1	FRACTURE - RT FRONTAL BO	0	C	D
3	NAGARAJ	25	M	12407	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
4	JEGANATHAI	58	M	12411	RTA	0	1	1	0	0	0	0	0	1	SDH - RT TEMP PAR . SAH - R	1	C	D
5	KASTHURI	60	F	12428	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT GC REGION	0	C	D
6	DAVID	25	M	12435	RTA	0	0	0	0	0	0	0	1	1	FRACTURE - LT ORBIT AND M	0	C	D
7	KUMAR	24	M	12443	RTA	0	1	0	0	0	0	0	1	1	FRACTURE - LEFORT	0	C	D
8	KUMARAVEL	35	M	12451	RTA	0	1	0	0	0	0	0	1	1	FRACTURE - NEC, LT FRONTA	1	C	D
9	THULASI	55	M	12478	RTA	0	1	1	0	0	0	0	0	1	SDH - RT TEMP PAR . SAH - TI	1	C	D
10	JAGADEESAI	63	M	12487	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - BIFRONTAL	0	C	D
11	RADHA	27	F	12496	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT MAXILLA	0	C	D
12	SAMSAD ANS	26	M	12516	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - RT FRONTAL BO	0	C	D
13	ARUMUGAM	32	M	12529	FALL	0	0	0	0	1	0	0	0	1	EDH-RT PARIETAL,SDH-RT TE	1	C	D
14	RAVI	42	M	12531	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL	0	C	D
15	PANDIAN	22	M	33244	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT FRONTAL BO	0	C	D
16	RAMAIAH	42	M	12536	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTO PA	0	C	D
17	SUGUMAR	25	M	12547	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - FRONTAL BONE	0	C	D
18	ANAND	16	M	12548	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - LT FRONTAL BO	0	C	D
19	SURESH	33	M	12557	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
20	FEROZ ALI	37	M	12575	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - FRONTAL BONE	0	C	D
21	AFZAL	26	M	12586	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL , C	1	C	D
22	GANESH	26	M	12588	FALL	0	1	0	0	0	1	1	1	1	FRACTURE - RT FRONTAL BO	1	C	D
23	MANIKUMAR	57	M	12590	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - LT FRONTAL BO	0	C	D
24	SATISH	26	M	12597	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LAT WALL OF LT	0	C	D
25	JEGADEESAI	63	M	12601	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - BIFRONTAL RE	0	C	D
26	VELU	25	M	12602	ASSAULT	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL , C	1	C	D
27	RAGHUPATH	55	M	12604	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - LAT WALL OF RT	0	C	D
28	SARVANAN	21	M	12624	RTA	1	0	0	0	0	0	0	0	0	FRACTURE - RT PARIETAL BO	0	C	D
29	VANRAJA	25	M	12628	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - RT PARIETAL BO	0	C	D
30	DURAIMURU	18	M	12652	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
31	MUNIAMMAL	42	F	12668	RTA	1	1	1	0	1	0	0	0	1	EDH - RT PARIETAL REGION	0	C	D
32	KANNAN	44	M	12677	FALL	0	1	1	0	1	0	0	0	1	FRACTURE - RT OCCIPITAL B	1	C	D
33	AMBROSE	35	M	12686	FALL	0	1	1	0	0	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
34	SHANMUGAM	28	M	12700	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT GC REGION	0	C	D
35	PALANI	46	M	12704	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - BIFRONTAL SD	1	C	D
36	ELUMALAI	24	M	12758	FALL	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
37	RAMACHAND	52	M	12773	ASSAULT	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
38	MADURAI PA	23	M	12821	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT OCCIPITAL B	0	C	D
39	JEGADEESAI	19	M	12830	RTA	1	1	1	0	0	1	0	1	1	FRACTURE - RT FRONTAL BO	0	C	D
40	KOLANJI	33	M	12826	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL BO	0	C	D
41	JEYANDAN	39	M	12863	RTA	0	1	1	0	1	0	0	0	1	SAH - RT FRONTOPAR . CONT	1	C	D
42	SUMATHY	25	F	12888	RTA	0	0	1	0	0	0	0	0	1	CONTUSION - LT GC REGION	0	C	D
43	KANNAN	24	M	12889	RTA	0	1	0	0	0	1	1	1	1	FRACTURE - RT ORBIT AND F	1	C	D
44	AKBAR	28	M	12894	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - BASIFRONTAL	0	C	D
45	MAHADEVAN	27	M	12896	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - LT FRONTAL BO	0	C	D
46	CHINNAUZHA	48	M	12899	FALL	0	1	1	0	1	0	0	0	1	SDH -LT FP REGION	0	C	D
47	SANKAR	41	M	12907	RTA	0	1	1	0	1	0	0	0	1	SDH - LT TEMPOROOCCIPITA	0	S	D
48	VIGNESH	20	M	12930	RTA	1	1	1	0	0	0	0	0	1	FRA -RT PARIETAL BONE WI	1	S	D
49	PALANI	45	M	12938	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT PARIETAL	0	C	D
50	KUMAR	40	M	12994	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
51	GOVIND	45	M	13004	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORAL	0	C	D
52	RAJU	28	M	13042	FALL	0	1	1	0	0	0	0	0	1	SDH - RT PARIETL . CONTUSI	1	C	D
53	JANAKIRAM	65	M	13062	FALL	0	0	1	0	0	0	0	0	1	SDH - THIN - LT TEMPOROPRI	0	C	D
54	SEKAR	26	M	13071	ASSAULT	0	1	1	0	1	0	0	0	1	FRACTURE - RT OCCIPITAL . I	1	C	D
55	ELAKIYAN	38	M	13087	FALL	0	1	1	0	0	0	0	0	1	SDH - THIN - RT FTP REGION	0	C	D
56	NAGOOR ME	24	M	13093	FALL	1	1	0	0	0	1	1	1	1	FRACTURE - LT FRONTAL BO	1	S	D
57	DHANALAKSI	36	F	13114	RTA	0	1	1	0	1	0	0	0	1	CONTUSION- LT MED FRONTA	1	C	D
58	THANIKAIVEL	45	M	13137	FALL	0	1	1	0	1	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
59	ELUMALAI	22	M	13159	RTA	0	1	1	0	0	0	1	1	1	FRACTURE - LT FRONTAL BO	1	C	D
60	LOKESH	23	M	13163	RTA	0	1	1	0	1	0	0	0	1	CONTUSION -LT FRONTAL , IN	1	C	D
61	PALANI	50	M	13177	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL , I	1	C	D
62	IYANAR	60	M	13179	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
63	RAJKUMAR	32	M	13198	RTA	0	0	0	0	0	1	1	1	1	FRACTURE - RT FRONTAL BO	1	C	D
64	MOORTHY	60	M	13202	FALL	0	1	1	0	0	0	0	0	1	SDH - LT FRONTOPARIETAL .	1	C	D
65	PRAKASH	37	M	13205	RTA	0	1	1	1	0	0	0	0	1	SAH - LT PARIETAL , LT SYLVI	0	C	D
66	DHANDAYUT	45	M	13207	ASSAULT	0	0	0	0	0	0	0	0	0	FRACTURE - RT TEMPORAL B	0	C	D
67	RAJESH	24	M	13219	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - RT OCCIPITAL B	0	C	D
68	JAYA	50	F	13241	RTA	0	1	1	1	0	0	0	0	1	SAH - LT FRONTAL	0	C	D
69	GAYATHRI	21	F	13243	RTA	1	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL.	1	C	D

70	ELLAPPAN	50	M	13246	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
71	NANDAKUMA	42	M	13250	FALL	0	1	0	0	0	1	0	1	1	FRACTURE - RT FRONTAL BO	1	C	D
72	VENKATESH	21	M	13254	ASSAULT	1	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORO P	0	C	D
73	AMUDHA	29	F	13270	FALL	0	1	1	0	0	0	0	0	1	CONTUSION -LT PARIETAL	0	C	D
74	LALITHA	35	F	13290	FALL	0	1	1	1	0	0	0	0	1	SAH - INTERHEM BLEED . FRA	1	C	D
75	SURESH	22	M	12465	FALL	0	1	1	0	0	0	0	0	1	SDH - LT TEMPOROPARIETAL	0	C	D
76	SHANKAR	17	M	13450	FALL FRM TRAIN	0	1	0	0	0	1	1	1	1	FRACTURE - RT FRONTAL CC	1	S	D
77	ELAVARASAI	20	M	13458	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - RT OCCIPITAL	0	C	D
78	CHELLAMMA	70	F	13570	RTA	0	1	1	0	0	0	0	0	1	SDH - THIN - RT FTP REGION	0	C	D
79	SAKTHIVEL	16	M	13514	RTA	0	1	1	0	1	1	1	1	1	FRACTURE - RT FRONTAL WI	1	C	D
80	JAYAMMAL	46	F	13519	ASSAULT	0	0	0	0	0	0	0	0	0	SAH - ANT INTERHEM BLEED	0	C	D
81	ANNAMALAI	35	M	13546	FALL	0	1	1	0	0	0	0	0	1	SDH - RT PAARITOOCCIPITAL	0	S	D
82	NAGARAJ	24	M	13547	FALL	1	1	0	0	1	0	0	0	1	CONTUSION - LT OCCIPITAL F	0	C	D
83	SURESH	30	M	13551	RTA	0	0	0	0	0	1	0	0	1	FRA -RT TEMPORAL BONE WI	1	S	D
84	KARTHIKEYA	23	M	13568	FALL	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL BO	1	S	D
85	PATTU	50	F	13579	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - LT TEMP . SDH	1	C	D
86	KAMAL	32	M	13580	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - LT TEMPORAL	0	C	D
87	KANNAN	30	M	13597	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - LT TEMPORAL B	0	C	D
88	NAHIM BASH	40	M	13695	FALL	0	1	0	0	0	0	0	1	1	FRACTURE - RT FRONTAL	0	C	D
89	GNANASEKA	30	M	13611	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - FRONTOPARIE	0	C	D
90	GANDHIYAYA	44	F	13617	RTA	0	1	1	0	1	0	0	0	1	SDH - RT FRONTAL	0	S	D
91	VENKATESH	34	M	13631	RTA	0	1	1	0	0	0	0	1	1	FRACTURE - RT OCCIPTAL BO	1	C	D
92	MANIKANDAI	35	M	13632	ASSAULT	0	1	0	0	0	1	1	1	1	FRACTURE - LT TEMPORAL B	1	C	D
93	JOSEPH	27	M	13633	RTA	0	1	1	0	0	0	0	0	1	EDH - LT FRONTAL	0	S	D
94	VINAYAGAM	51	M	13636	FALL	0	1	1	0	0	0	0	0	1	SAH - RT FRONTOPARIETAL	0	C	D
95	GANESH	30	M	13638	FALL	0	1	0	0	1	0	0	0	1	EDH - RT TEMPOROPRIETAL	0	C	D
96	MANIKAVASA	34	M	13655	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT OCCIPITAL BO	0	C	D
97	ISMAIL	45	M	13661	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
98	KRISHNASAM	42	M	13667	FALL	0	1	0	0	0	1	1	1	1	FRACTURE - LT FRONTAL BO	1	C	D
99	SARAVANAN	18	M	13689	RTA	0	0	0	0	0	1	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
100	KESAVAN	20	M	13695	RTA	1	1	1	0	1	0	0	0	1	EDH - POSTR FOSSA	0	S	D
101	PRABAKARA	21	M	13717	FALL	0	1	1	0	0	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
102	SATHYA	25	F	13721	FALL	0	1	1	0	1	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
103	AROCKIASAI	56	M	13725	RTA	0	1	1	0	0	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
104	JAGANATHAI	61	F	13771	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - LT FRONTAL BO	0	C	D
105	JAGANATHAI	50	M	13786	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
106	BASKAR	49	M	13797	RTA	1	1	1	0	0	0	0	0	1	FRACTURE - LT OCCIPITAL BO	1	C	D
107	KARTHIKEYA	23	M	13798	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL BO	0	C	D
108	PANDIAN	35	M	13801	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - RT FRONTAL BO	0	C	D
109	SHERMADUR	37	M	13807	ASSAULT	0	1	1	1	0	0	0	0	1	SAH - LT SYLVIAN	0	C	D
110	SHAILAJA	30	F	13819	FALL	0	1	0	0	1	0	0	0	1	CONTUSION - LT PARIETAL AI	0	C	D
111	TAMILARASA	30	M	13826	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - RT TEMPORAL B	0	C	D
112	ALAMELU	30	F	13833	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTOPARI	0	C	D
113	RAVI	48	M	13842	RTA	0	1	1	1	0	0	0	0	1	SAH - LT FRONTOPARIETAL	0	C	D
114	IMMANUEL	70	M	13852	RTA	0	1	1	0	0	0	0	0	1	SAH - INTERHEM BLEED .	0	C	D
115	RAMESH	20	M	13854	FALL	1	1	1	0	1	0	0	0	1	CONTUSION - BIL BASIFRONT	0	C	D
116	GOVINDARA	47	M	13871	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - RT TEMPORAL B	0	C	D
117	MURUGESAI	50	M	13883	RTA	0	1	1	1	0	0	0	0	1	SAH - LT FRONTOPARIETAL	0	C	D
118	SURYA	15	M	13891	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL BO	0	S	D
119	KATHIRVEL	48	M	13901	RTA	0	1	1	0	0	0	0	0	1	SAH - POST INTERHEM REGIC	1	C	D
120	VIJAYSHANK	22	M	13913	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - RT MAXILLARY I	0	C	D
121	ANNAMAL	55	F	13940	RTA	0	1	0	0	0	0	0	0	1	SAH - INTERHEM BLEED .	0	C	D
122	SEKAR	25	M	13946	ASSAULT	0	1	0	0	0	0	0	1	1	FRACTURE - RT FRONTAL AI	0	C	D
123	RAJAGOPAL	51	M	13958	FALL	0	1	0	0	0	0	0	0	1	SAH - RT PARIETAL	0	C	D
124	RAJKUMAR	50	M	13967	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL ,	1	C	D
125	RAMU	29	M	13982	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT OCCIPITAL	0	C	D
126	MANOHAR	21	M	13987	RTA	0	1	0	0	0	0	1	0	1	FRACTURE - BASE OF SKULL	1	S	D
127	VISWANATH	15	M	13988	FALL FRM TRAIN	0	1	0	0	0	1	0	1	1	FRACTURE - FRONTAL BONE	1	C	D
128	SALSA	51	F	13998	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - BIFRONTAL RE	0	C	D
129	SELVAMURU	37	F	14008	RTA	0	0	0	0	0	0	0	0	0	FRACTURE - RT MASTOID	0	C	D
130	SHANKAR	40	M	14037	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL BO	0	C	D
131	KARTHIK	16	M	14073	RTA	0	1	1	0	1	0	0	0	1	EDH - RT FRONTAL	0	C	D
132	SAROJA	60	F	14085	FALL	0	0	1	0	0	0	0	0	1	SDH - THIN - LT FRONTOTEMI	0	C	D
133	VINAYAGAM	32	M	14088	RTA	0	1	1	0	0	0	0	1	1	FRACTURE - LT OCCIPITAL BO	1	C	D
134	ASHRAJ	35	M	14098	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - LT MAXILLA	0	C	D
135	NAGARAJ	35	M	14107	RTA	1	0	0	0	0	0	0	0	0	FRACTURE - LT TEMPORAL	0	C	D
136	MURUGAN	35	M	14120	RTA	1	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	1	C	D
137	SHIVAJI	34	M	14128	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
138	KANNAN	65	M	14133	RTA	0	1	1	0	1	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
139	FIRDOUSE	18	F	14148	RTA	1	1	0	0	0	1	0	1	1	FRACTURE - SKULL BASE WI	1	C	D

140	GOPAL	19	M	14157	FALL	1	1	1	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	1	C	D
141	SEKAR	35	M	14158	FALL	0	1	1	0	1	0	0	0	1	FRACTURE - RT PARIETAL BC	0	C	D
142	RAJ	38	M	14160	RTA	0	1	0	0	1	0	0	1	1	FRACTURE - LT OCCIPITAL BC	1	C	D
143	KATHIR	22	M	14168	RTA	0	1	1	0	1	0	0	0	1	FRACTURE - RT FRONTAL BC	1	C	D
144	SUNDARI	40	F	14176	RTA	0	1	1	0	1	0	0	0	1	FRACTURE - LT FRONTAL BO	1	C	D
145	BHAVANIDEV	38	F	14186	FALL	0	1	1	0	1	0	0	0	1	FRACTURE - RT OCCIPITAL B	1	C	D
146	SETHUPATH	32	M	14203	ASSAULT	0	1	0	0	1	0	0	0	1	CONTUSION - LT PARIETAL	0	C	D
147	ARUNACHAL	65	M	14204	ASSAULT	0	1	0	0	0	1	1	1	1	FRACTURE - LT TEMPOROPA	1	C	D
148	SUNDARAVE	26	M	14211	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
149	MURTHY	39	M	14212	FALL	0	1							1	FRACTURE - RT TEMPORAL B	1	C	D
150	KANBALI	46	M	14223	FALL	0	1	0	0	1	0	0	0	1	EDH - LT PARIETAL	0	S	D
151	SHANKAR	30	M	14228	RTA	0	1	1	1	0	0	0	0	1	FRACTURE - LT PARIETAL BO	1	C	D
152	PALANISAMY	32	M	14242	RTA	0	1	1	1	0	0	0	0	1	SAH - LT FRONTOPARIETAL	0	C	D
153	SIVAKUMAR	27	M	14244	FALL	0	1	0	0	0	1	1	1	1	FRACTURE - LT PARIETAL BO	1	C	D
154	SUBALAKSHI	65	F	14249	RTA	0	1	0	0	0	0	0	0	1	SAH - LT FRONTOPARIETAL	0	C	D
155	CHARLES	24	M	14255	ASSAULT	1	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL B	0	C	D
156	RANJITH	30	M	14256	RTA	0	1	0	0	0	0	0	0	1	EDH - LT FRONTAL	0	C	D
157	GANTHARUB	45	M	14263	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTOPAI	0	C	D
158	RAVI	22	M	14260	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	1	C	D
159	DINESH	18	M	14279	RTA	1	1	0	0	0	0	0		1	FRA -RT FRONTAL BONE	0	S	D
160	PERUMAL	25	M	14330	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL F	0	C	D
161	VINOTH	21	M	14333	RTA	0	1	0	0	0	0	0	1	1	FRACTURE - LT FRONTAL DE	0	S	D
162	KRISHNARA.	53	M	14314	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
163	NURUGAN	24	M	14317	RTA	1	1	0	0	0	0	0	0	1	EDH - LT FRONTAL	0	C	D
164	RAVI	45	M	14326	FALL	0	1	0	0	0	0	0	0	1	SDH - RT PARIETL . FRACTUR	1	C	D
165	MUNUSAMY	45	M	14327	RTA	0	1	0	0	0	0	0	0	1	EDH - RT TEMPORAL	0	C	D
166	NAGALAKSH	17	F	14329	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT OCCIPITAL BC	0	C	D
167	BABU	37	M	14333	RTA	0	0	0	0	0	0	0	0	0	CONTUSION - LT GC REGION	0	C	D
168	ELUMALAI	36	M	14339	RTA	0	1	1	0	0	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
169	MARIAPPAN	30	M	14351	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL BC	0	C	D
170	ARUNKUMAF	38	M	14354	ASSAULT	0	1	0	0	0	1	1	1	1	FRACTURE - MASTOID WITH (	1	C	D
171	GAJENDRAN	24	M	14374	RTA	1	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
172	JALEEL BASI	58	M	14375	RTA	0	1	1	0	1	0	0	0	1	SDH - LT FRONTO PARIETAL	0	C	D
173	SADAM HUS	22	M	14403	FALL	0	0	0	0	0	0	0	0	0	CONTUSION - LT GC REGION	0	C	D
174	ANAND	55	M	14407	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT OCCIPUT	0	C	D
175	SUBRAMANI	50	M	14418	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - RT FRONTAL WI	1	C	D
176	PRAKASH	42	M	14425	RTA	0	1	1	0	1	0	0	0	1	FRACTURE - RT OCCIPUT. SC	1	C	D
177	BALAMURUC	31	M	14438	RTA	0	1	0	0	1	0	0	0	1	EDH -LT FRONTOTEMPORAL	0	C	D
178	DEVRAJ	50	M	14441	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - RT TEMPORAL B	1	C	D
179	KALAIARASI	18	F	14467	RTA	1	1	0	0	1	0	0	0	1	EDH - RT TEMPORAL	0	C	D
180	MOHAN RAO	52	M	14501	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORO F	0	C	D
181	SEKAR	35	M	14510	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - RT OCCIPUT	0	C	D
182	KASTHURI	65	F	14536	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL	0	C	D
183	SELVAM,	35	M	14551	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - LT ORBIT LAT. L	0	C	D
184	MURUGAN	42	M	14557	FALL	0	1	0	0	1	0	0	0	1	EDH - LT TEMPOROPARIETAL	0	C	D
185	SHEIKH MD	30	M	14569	ASSAULT	0	1	0	0	0	1	1	1	1	FRACTURE - BASE OF SKULL	1	S	D
186	NATHIYA	26	F	14570	RTA	0	1	1	0	1	0	0	0	1	SDH - RT PARIETAL.	0	C	D
187	MANIKANDAI	22	M	14581	RTA	0	1	0	0	1	0	0	0	1	CONTUSION- LT PERISYLVIAI	0	C	D
188	DHANASEKA	33	M	14585	FALL	0	1	0	0	0	1	0	1	1	FRACTURE - BASE OF SKULL	1	C	D
189	PERUMAL	64	M	14595	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT LAT ORBIT.	0	C	D
190	SATHISHKUI	24	M	14398	RTA	0	1	0	0	0	1	1	1	1	FRACTURE - LT TEMPORAL B	1	C	D
191	CHARLES	30	M	14627	RTA	0	1	1	0	0	0	0	0	1	SDH - RT FRONTOPARIETAL	0	C	D
192	KUMAR	20	M	14636	RTA	1	1	1	0	0	0	0	0	1	FRACTURE - LT TEMPORAL B	1	C	D
193	LOGANATHA	60	M	14640	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
194	NAGAPPAN	60	M	14466	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL F	1	C	D
195	SUDHAKAR	31	M	14671	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - BIFRONTAL	0	C	D
196	DILIPKUMAR	21	M	16673	RTA	0	1	1	0	1	0	0	0	1	FRACTURE - LT FRONTAL BO	1	C	D
197	ANANDSELV/	19	M	14680	FALL	1	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
198	MUTHU	25	M	14687	RTA	0	1	1	0	0	0	0	0	1	SAH - RT TEMPOROPARIETAL	0	C	D
199	VADIVEL	75	M	14689	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
200	NAGAPPAN	60	M	14690	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	1	C	D
201	SHANMUGAN	24	M	14695	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
202	SUNDARAM	30	M	14707	RTA	0	1	1	0	1	0	0	0	1	FRACTURE - LT OCCIPUT . CC	1	C	D
203	SUBRAMANI	66	M	14712	ASSAULT	0	1	0	0	0	1	1	1	1	FRACTURE - RT TEMPORAL B	1	C	D
204	SIVAGAMI	56	F	14720	RTA	0	0	0	0	0	0	0	0	0	SAH - LT FRONTAL . CONTUS	1	C	D
205	MURUGAN	43	M	14726	RTA	1	1	0	0	0	0	0	0	1	SDH - LT FRONTAL. CONTUSI	1	S	D
206	ANBALAGI	35	F	14735	RTA	0	1	0	0	0	0	0	0	1	IVH - 4TH VENTRICLE	0	C	D
207	MEENAKSHI	35	F	14735	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTOPARI	1	S	D
208	SASIKUMAR	35	M	14755	FALL	1	1	0	0	0	0	0	0	1	FRACTURE - OCCIPUT , CONT	1	C	D
209	KARUPPANN	64	M	14765	FALL	0	1	0	0	0	0	0	0	1	EDH - RT TEMPORAL REGION	0	C	D

210	KARTHIK	23	M	14787	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT PARIETAL BO	1	C	D
211	MADHNASEK	43	M	14807	RTA	1	1	0	0	0	0	0	0	1	CONTUSION - RT FRONTAL.	0	C	D
212	KANNAGI	49	F	14803	RTA	1	0	0	0	0	0	0	0	0	SAH - RT FRONTAL	0	C	D
213	SATHISH	21	M	14815	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORAL	0	C	D
214	YUVARAJ	40	M	14831	RTA	0	1	0	0	0	0	0	1	1	FRACTURE - LT PARIETAL BO	1	C	D
215	DASS	40	M	14842	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL AI	1	C	D
216	BOOPALAN	28	M	14845	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	1	C	D
217	RAMESH	33	M	14848	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - RT TEMPORAL.	0	C	D
218	NARAYANAN	40	M	14849	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL	0	C	D
219	VALLALAN	18	M	14898	FALL	1	1	0	0	0	0	0	0	1	SAH - RT FRONTOPARIETAL	0	C	D
220	NAGARAJ	29	M	14946	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL .(	1	C	D
221	CHAKRAVAR	40	M	14949	ASSAULT	0	1	0	0	0	0	0	1	1	FRACTURE - RT FRONTAL DE	1	S	D
222	PUSHPA	35	F	14952	RTA	0	1	0	0	0	0	0	0	1	SDH - LT FRONTOPARIETAL	0	C	D
223	SAIRAM	60	M	14954	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - RT FRONTAL	0	C	D
224	PALANI	28	M	14957	FALL	0	0	0	0	0	0	0	0	0	FRACTURE - RT TEMPORAL B	1	C	D
225	VINAYAGAM	32	M	14958	RTA	0	1	1	0	1	0	0	0	1	FRACTURE - LT MASTOID. CC	1	C	D
226	RAJASEKAR	52	M	14963	FALL	0	1	0	0	1	0	0	0	1	EDH - LT PARIETAL	0	C	D
227	SELVI	40	F	14996	ASSAULT	0	1	1	0	1	0	0	0	1	CONTUSION - RT PARIETAL	0	C	D
228	MANNANGAT	65	M	14999	RTA	0	1	1	0	0	0	0	0	1	SDH - THIN - RT FTP REGION	0	C	D
229	VENKATESH	28	M	15000	RTA	0	1	1	0	0	0	0	0	1	SDH - RT FRONTOPARIETAL,F	1	C	D
230	SELVI	50	F	15039	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT BASAL GAN	0	C	D
231	THENPANDI	15	M	15068	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL	0	C	D
232	ELUMALAI	67	M	15069	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT NEC	0	C	D
233	VIJAY	29	M	15092	ASSAULT	0	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL BO	0	C	D
234	RAJA	21	M	15124	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL BO	1	C	D
235	SATISH	23	M	15127	RTA	0	1	1	0	1	0	0	0	1	CONTUSION -LT BASIFRONTA	0	C	D
236	RAMAYI	70	F	15161	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - BIFRONTAL	0	C	D
237	VIJAY	27	M	15192	ASSAULT	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL BO	1	C	D
238	JOHN	48	M	15223	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTOPAI	0	C	D
239	SASIKUMAR	27	M	15226	FALL	0	1	0	0	0	1	1	1	1	FRACTURE - RT FRONTAL BO	1	C	D
240	MUNUSAMY	50	M	15241	RTA	0	1	1	0	1	0	0	0	1	SDH - RT FRONTOPARIETL	0	C	D
241	ARUNKUMAR	45	M	15241	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - RT FRONTALBOI	1	S	D
242	VIJAY	21	M	15254	RTA	0	1	1	0	1	0	0	0	1	SDH - LT FRONTOPARIETAL	0	C	D
243	VENKATESH	21	M	15254	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
244	CHELIAPPAN	40	M	15266	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	1	C	D
245	SEKAR	43	M	15269	ASSAULT	0	1	0	0	0	0	0	1	1	FRACTURE - RT FRONTAL BO	1	C	D
246	SHUNMUGAM	30	M	15272	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - LT TEMPORAL	0	C	D
247	SUBRAMANI	41	M	15294	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT MAXILLA	0	C	D
248	MURUGESAN	47	M	15295	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - BIFRONTAL CO	0	C	D
249	RANJITH SIN	38	M	15315	ASSAULT	0	1	0	0	0	0	0	0	1	LT FRONTAL EDH	0	C	D
250	NAGAMMAL	70	F	15330	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - BIFRONTAL, SA	0	C	D
251	KANDASAMY	60	M	15360	RTA	0	1	0	0	0	0	0	0	1	SDH - RT FRONTOPARIETAL.	0	C	D
252	KAMAL	21	M	15328	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT DRONTAL . E	1	C	D
253	SARATHKUM	18	M	15406	RTA	1	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTOTEM	1	C	D
254	KARTHIK	18	M	15407	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL. FR	0	C	D
255	MUNIYANDI	34	M	15408	RTA	0	0	0	0	0	0	0	0	0	SAH - ANTERIOR INTERHEMIS	0	C	D
256	RAJANI	32	M	15413	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL	0	C	D
257	KARTHIK	27	M	15417	ASSAULT	0	1	0	0	0	0	0	0	1	EDH - LT OCCIPITAL	0	C	D
258	SARAVANAN	39	M	15446	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - RT ORBIT LATEF	0	C	D
259	LAKSHMANA	78	M	15469	RTA	0	1	0	0	0	0	0	0	1	SDH - RT TEMPOROPARIETAL	0	C	D
260	NATARAJAN	55	M	15524	FALL	0	0	0	0	0	0	0	0	0	CONTUSION - LT FRONTAL RI	0	C	D
261	HARIDOSS	60	M	15581	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - BIFRONTAL RE	0	C	D
262	VASANTHI	18	F	15583	RTA	1	1	0	0	0	0	0	0	1	EDH - LT FRONTAL THIN	0	C	D
263	SUBRAMANI	65	M	15588	FALL	0	1	0	0	0	0	0	0	1	CONTUSION - RT FRONTAL	0	C	D
264	RAGHUNATH	40	M	15611	RTA	0	1	1	1	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
265	CHANDRA	50	F	15622	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT OCCIPITAL B	0	C	D
266	RADHA	48	F	15624	RTA	1	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORAL	0	C	D
267	RAVINDRAN	20	M	15640	RTA	1	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
268	MANI	58	M	15679	RTA	0	1	0	0	1	0	0	0	1	EDH - RT FRONTAL	0	C	D
269	JAYALAKSHM	63	F	15681	FALL	0	1	1	1	0	0	0	0	1	SAH - RT TEMPORAL	0	C	D
270	SURESH	30	M	15715	RTA	0	0	0	0	0	0	0	0	0	SAH - CISTERNAL BLEED	0	C	D
271	JAIGANESH	15	M	15718	RTA	0	1	0	0	0	0	0	0	1	SDH - LT TEMPORAL	0	C	D
272	UTTAM	22	M	15720	FALL	0	1	0	0	0	0	0	0	1	CONTUSION - RT FRONTAL	0	C	D
273	SARADHA	68	F	15725	FALL	0	0	0	0	0	0	0	0	0	SDH - THIN - RT FRONTAL	0	C	D
274	SHANTHI	50	F	15736	RTA	0	1	0	0	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
275	KRISHNAMO	73	M	15722	RTA	0	0	0	0	0	0	0	0	0	CONTUSION - LT FRONTAL RI	0	C	D
276	BOOPATHY	36	M	15779	FALL	0	0	0	0	0	0	0	0	0	CONTUSION - LT GC REGION	0	C	D
277	SATISH	28	M	15800	RTA	1	1	0	0	0	0	0	0	1	CONTUSION - RT FRONTOPAI	0	C	D
278	VENKATESH	45	M	15802	FALL	0	1	0	0	0	0	0	0	1	CONTUSION - RT BASIFRONT	0	C	D
279	SADASIVAM	50	M	15809	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT FRONTAL BO	0	C	D

280	BHARATRAJ	18	M	15812	FALL FRM TRAIN	1	1	0	0	0	1	0	1	1	FRACTURE - RT FRONTAL CC	1	S	D
281	RAMIREDDY	18	M	15824	RTA	1	1	0	0	0	1	1	1	1	FRACTURE - RT FRONTAL BC	1	C	D
282	PERUMAL	75	M	15830	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - BIFRONTAL RE	0	C	D
283	LAKSHMI	38	F	15855	FALL	0	1	1	0	1	0	0	0	1	FRACTURE - LT FRONTAL , C	1	C	D
284	JAYAPAUL	28	M	15870	FALL	1	1	1	0	1	0	0	0	1	SDH - LT FRONTAL ,	0	C	D
285	VIJAYSHANT	20	F	15876	FALL	1	0	0	0	0	0	0	0	0	SAH - CISTERNAL BLEED	0	C	D
286	KARUNAKAR	35	M	15885	FALL	0	1	0	0	0	0	0	0	1	EDH - LT TEMPOROPARIETAL	0	C	D
287	RAVI	43	M	15887	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPOROPA	0	C	D
288	RAVI	60	M	15910	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
289	DAYALAN	40	M	18919	RTA	0	1	0	0	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
290	LAKSHMI	75	F	15290	FALL	0	1	0	0	0	0	0	0	1	CONTUSION - BIFRONTAL RE	0	C	D
291	AKBAR	44	M	15938	FALL	0	1	0	0	0	0	0	0	1	EDH - LT PARIETAL	0	C	D
292	GANESAN	22	M	15944	RTA	0	1	0	0	0	0	0	0	1	EDH - RT TEMPORAL REGION	0	C	D
293	JAYARAMAN	75	M	15946	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - RT FRONTAL	0	C	D
294	MUKUNDAN	24	M	15448	FALL	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
295	ZAKIR HUSS/	35	M	15950	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
296	MUNUSAMY	50	M	15973	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
297	CHITRAVASA	19	M	15974	FALL	1	1	0	0	0	0	0	0	1	FRACTURE - RT FRONTAL BC	0	C	D
298	RAMAR	48	M	15981	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
299	CHANDRAN	28	M	15991	FALL	1	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
300	MOHAN	22	M	15997	FALL	0	1	1	1	0	0	0	0	1	SAH - RT PARIETAL	0	C	D
301	ARUMUGAM	50	M	16007	RTA	1	1	1	0	0	0	0	0	1	SDH - LT TEMPOROPARIETAL	0	C	D
302	APPUTHAHIF	70	M	16011	FALL	0	0	0	0	0	0	0	0	0	SAH - BASAL CISTERNAL BLE	0	C	D
303	SABARINATH	25	M	16027	RTA	0	1	0	0	0	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
304	GOVINDARA	65	M	16038	RTA	0	0	0	0	0	0	0	0	0	CONTUSION - RT FRONTAL R	0	C	D
305	MANIKANDAI	18	M	16050	FALL	1	1	0	0	0	0	0	1	1	FRACTURE - SKULL BASE WI	1	C	D
306	BACKIANATH	48	M	16057	FALL	0	1	0	0	0	0	0	0	1	SDH - RT FRONTOPARIETAL	0	C	D
307	MARIAPPAN	36	M	16091	FALL	0	0	0	0	0	0	0	0	0	CONTUSION - RT FRONTAL R	0	C	D
308	MOORTHY	30	M	16097	RTA	0	1	0	0	0	0	0	0	1	SDH - RT FRONTOPARIETAL	0	C	D
309	AJITH KUMAI	15	M	16100	RTA	0	0	0	0	0	0	0	0	0	CONTUSION - RT FRONTAL R	0	C	D
310	BALAMURUG	31	M	16104	FALL	0	1	0	0	0	0	0	1	1	FRACTURE - RT FRONTAL BC	1	C	D
311	CHANDRA	60	F	16105	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL	0	C	D
312	MANIKANDAI	28	M	16119	RTA	1	1	0	0	0	1	1	1	1	FRACTURE - LT FRONTAL CO	1	S	D
313	SABARINATH	23	M	16134	FALL	0	1	1	1	0	0	0	0	1	SAH - LT PERISYLVIAN REGIC	0	C	D
314	NATARAJAN	55	M	16137	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
315	THALAIVAR E	46	M	16138	RTA	0	0	0	0	0	0	0	0	0	CONTUSION - LT GC REGION	0	C	D
316	GOPI	25	M	16155	RTA	0	1	1	1	0	0	0	0	1	SAH - LT PARIETOOCCIPITAL	0	C	D
317	DHANASEKA	44	M	16156	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL BO	1	C	D
318	JOSEPH	32	M	16164	FALL	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
319	CHINNAKANI	60	M	16216	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORAL I	0	C	D
320	RAJAMANICK	58	M	16220	FALL	0	1	0	0	0	1	0	1	1	FRACTURE - BASE OF SKULL	1	S	D
321	KALIYAMMAL	62	F	16230	RTA	0	1	1	1	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
322	RAJAKUMAR	58	F	16231	RTA	0	1	1	0	1	0	0	0	1	SDH - LT TEMPOROPARIETAL	0	C	D
323	RANI	52	F	16242	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
324	PAULRAJ	28	M	16243	RTA	1	1	1	0	0	0	0	0	1	SDH - LT FRONTOTEMPOROF	0	S	D
325	BALAMURUG	30	M	16246	FALL	0	1	0	0	1	0	0	0	1	EDH - LT TEMPORAL POLAR	0	S	D
326	ARUMUGAM	45	M	16258	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL R	0	C	D
327	PANDIAN	18	M	16260	RTA	1	1	1	1	0	0	0	0	1	SAH - TENTORIAL BLEED	0	C	D
328	ABIMANYU	22	M	16265	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL RE	0	C	D
329	THIRUNAVUI	30	M	16286	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
330	RAJNIKANTH	38	M	16308	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL B	0	C	D
331	GANDHIMATI	38	M	16310	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	1	C	D
332	DINESH	22	M	16311	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
333	DEBO	18	M	16313	RTA	1	1	0	0	0	1	0	1	1	FRACTURE - COMPOUND DEI	1	S	D
334	DHAMODAR/	48	M	16327	RTA	1	1	1	0	1	0	0	0	1	SDH - RT FTP REGION	0	C	D
335	CHINAMMAL	65	F	16337	RTA	0	1	1	0	0	0	0	0	1	SDH - RT FRONTOPARIETAL F	0	C	D
336	RAMKUMARI	62	F	16338	FALL	0	1	1	1	0	0	0	0	1	SAH - TENTORIAL BLEED	0	C	D
337	NARAYANI	41	F	16340	FALL	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
338	MEERAN	27	M	16371	FALL	0	1	0	0	1	0	0	0	1	EDH - LT TEMPOROPARIETAL	0	S	D
339	PARTHIBAN	35	M	16376	RTA	0	1	0	0	1	0	0	0	1	EDH - LT PARIETOOCCIPITAL	0	C	D
340	RAMAIAH	46	M	16384	FALL	0	1	0	0	1	0	0	0	1	EDH - RT TEMPOROPARIETAI	0	C	D
341	MOHD SAFFA	35	M	16390	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
342	PAULRAJ	25	M	16391	RTA	0	1	0	0	1	0	0	0	1	EDH - LT TEMPORAL REGION	0	C	D
343	LOGANATHA	34	M	16393	RTA	0	1	0	0	0	1	1	0	1	FRACTURE - RT PARIETAL CC	1	S	D
344	VAIRAMUTHU	20	M	16399	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL RE	0	C	D
345	KUMAR	40	M	16403	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
346	ABISHADE	24	M	16404	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT FRONTAL BC	0	C	D
347	JAYAPRADH/	24	F	16410	FALL	0	0	0	0	0	0	0	0	0	SAH - CISTERNAL BLEED	0	C	D
348	MUTHUKUMA	32	M	16415	RTA	0	1	0	0	0	0	0	1	1	FRACTURE - LT FRONTAL CO	1	S	D
349	DHAMODAR/	48	M	16438	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL B	0	C	D

350	KALAIVANNA	18	M	16439	FALL FRM TRAIN	1	1	0	0	0	0	0	0	1	SDH - LT FRONTAL REGION	0	C	D
351	SRINIVASAN	35	M	16441	FALL	0	0	0	0	0	0	0	0	0	SDH - THIN - LT FRONTOTEMI	0	C	D
352	THANGAVELI	27	M	16440	RTA	0	1	0	0	0	0	0	0	1	EDH - RT PARIETAL REGION	0	C	D
353	RAMESH	32	M	16451	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
354	CHINNAMMA	35	F	16456	FALL	0	0	0	0	0	0	0	0	0	SDH- RT TEMPOROPARIETAL	0	C	D
355	VENKATESH	40	M	16461	FALL	0	1	0	0	0	0	0	0	1	SDH - RT FRONTOPARIETAL I	0	C	D
356	LAKSHMI	57	F	16463	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORO F	0	C	D
357	RADHAMANI	75	F	16464	FALL	0	0	1	0	0	0	0	0	1	SDH - THIN - RT FRONTOTEM	0	C	D
358	SURESH	27	M	16458	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL CO	1	S	D
359	RUBBAN	53	M	16479	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
360	ABDUL	40	M	16495	RTA	0	1	0	0	0	0	0	0	1	SAH - RT TEMPOROPARIETAL	0	C	D
361	DILLIRAJ	25	M	16498	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT TEMPORAL B	0	C	D
362	VIJAY	19	M	16502	RTA	1	1	0	0	0	1	1	1	1	FRACTURE - RT FRONTAL BO	1	C	D
363	ELANGOVAN	29	M	16509	RTA	0	1	0	0	0	0	0	0	1	CONTUSION- RT FRONTAL RE	0	C	D
364	SUBRAMANI	50	M	16531	RTA	1	1	1	0	1	0	0	0	1	CONTUSION - LT CEREBELLA	0	C	D
365	SIVA	20	M	16542	ASSAULT	1	1	0	0	1	0	0	0	1	EDH - LT TEMPOROPARIETAL	0	C	D
366	KANDHAN	33	M	16544	FALL	0	1	1	0	0	0	0	0	1	SDH - RT FRONTOTEMPORAL	0	C	D
367	SUNDARESA	70	M	16565	RTA	0	1	1	0	0	0	0	0	1	SAH - TENTORIAL BLEED	0	C	D
368	SAMUEL	34	M	16566	FALL	0	1	1	1	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
369	UDAYAKUMA	24	M	16567	RTA	0	1	0	0	1	0	0	0	1	EDH - RT TEMPORAL REGION	0	C	D
370	SARAVANAN	39	M	16579	RTA	1	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPOROP	0	C	D
371	MANJUNATH	26	M	16599	RTA	0	1	0	0	0	0	0	0	1	SAH - LT SYLVIAN	0	C	D
372	SURESHKUM	21	M	16605	RTA	0	1	0	0	1	0	0	0	1	EDH - LT TEMPORAL REGION	0	C	D
373	SENTHILRAJ	19	M	16617	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL BO	0	C	D
374	VENU	35	M	16629	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT ZMC	0	C	D
375	SUBRAMANI	65	M	16643	RTA	0	1	0	0	0	0	0	0	1	SAH - TENTORIAL BLEED	0	C	D
376	RAGINI	66	F	16660	RTA	0	1	1	1	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
377	ELUMALAI	60	M	16672	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORAL	0	C	D
378	GOWTHAM	21	M	16687	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
379	RICHU	39	M	16695	RTA	1	1	1	0	1	0	0	0	1	CONTUSION - RT GC REGION	0	C	D
380	KANDAPPAN	24	M	16737	RTA	0	1	0	0	0	0	0	0	1	EDH - RT FRONTAL	0	C	D
381	SATISHKUMA	30	M	16162	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL B	0	C	D
382	PARAMESWA	21	M	16763	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
383	SELVAM	40	M	16765	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
384	RUKKU	45	F	16764	FALL	0	1	1	1	0	0	0	0	1	SAH - LT PARIETAL REGION	0	C	D
385	SRINIVASAN	60	M	16773	RTA	0	1	1	0	1	0	0	0	1	SDH - RT FRONTOPARIETAL I	0	C	D
386	DHINAKARAN	21	M	16792	RTA	1	1	0	0	1	0	0	0	1	EDH - LT PARIETAL REGION	0	C	D
387	RANGANATH	23	M	16780	FALL FRM TRAIN	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
388	MOHAN	30	M	16782	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
389	KAMESH	20	M	16785	RTA	1	1	1	1	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
390	GOVINDAMM	49	F	16789	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL	0	C	D
391	SUBRAMANI	60	M	16789	RTA	0	0	1	0	0	0	0	0	1	SDH - THIN - LT FRONTOTEMI	0	C	D
392	VIGNESH	15	M	16793	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT PARIETAL	0	C	D
393	DHARMALING	58	M	16801	FALL	0	1	1	0	1	0	0	0	1	SAH - RT PERISYLVIAN REGIC	0	C	D
394	PRAKASH KU	24	M	16805	FALL FRM TRAIN	0	1	0	0	0	0	0	1	1	FRACTURE - RT FRONTAL AN	0	C	D
395	CHAKRAVAR	28	M	16821	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - RT FRONTAL BO	0	C	D
396	NEEL AMSTR	38	M	16834	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - RT FRONTAL BO	1	C	D
397	JOHNNY	56	M	16880	FALL	0	1	0	0	1	0	0	0	1	EDH - RT FRONTOPARIETAL	0	S	D
398	SURESH	29	M	16900	RTA	0	1	0	0	1	0	0	0	1	EDH - RT TEMPORAL REGION	0	C	D
399	MAGIMAIDAS	55	M	16908	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - RT FRONTAL RE	1	C	D
400	CHINNA	63	M	16923	RTA	0	1	0	0	1	0	0	0	1	EDH - RT PARIETAL REGION	0	C	D
401	KUMAR	28	M	16928	RTA	1	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
402	UDAYA	22	M	16935	RTA	0	1	0	0	0	1	1	1	1	FRACTURE - LT FRONTAL CO	1	S	D
403	MUNIAMMAL	50	F	16968	ASSAULT	0	1	0	0	1	0	0	0	1	CONTUSION - LT PARIETAL REGION		C	D
404	KARTHIKEYA	21	M	16985	RTA	1	1	0	0	1	0	0	0	1	EDH - RT FRONTAL REGION	0	C	D
405	EKAVALLI	55	F	16992	RTA	0	1	1	0	0	0	0	0	1	SDH - LT TEMPOROPARIETAL	0	C	D
406	UMA	36	F	16996	FALL	0	1	0	0	0	1	1	1	1	FRACTURE - LT FRONTAL CO	1	S	D
407	VIJAY	16	M	17001	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
408	JEGAN	24	M	17005	FALL	0	1	0	0	0	1	1	1	1	FRACTURE - LT PARIETAL CC	1	C	D
409	NAGARAJ	33	M	17042	RTA	0	1	1	0	0	0	0	0	1	SAH - RT FRONTOTEMPORAL	0	C	D
410	RAGHUNATH	56	M	17046	RTA	0	1	1	1	0	0	0	0	1	SAH - RT TENTORIAL REGION	0	C	D
411	GOVINDAMM	50	F	17040	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
412	THIRUPATHI	35	M	17041	FALL	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
413	RAMESH	29	M	17043	RTA	0	0	0	0	0	0	0	0	0	CONTUSION - LT GC REGION	0	C	D
414	KANNAN	75	M	17048	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORAL I	0	C	D
415	NEEDIARASU	40	M	17048	RTA	0	1	1	0	1	0	0	0	1	SDH - LT TEMPOROPARIETAL	0	C	D
416	DEVAN	40	M	17053	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - LT TEMPORAL I	0	C	D
417	RAGHUNATH	50	M	17070	RTA	1	1	1	0	1	0	0	0	1	SAH - RT TENTORIAL REGION	0	C	D
418	BABU	28	M	17081	RTA	1	1	1	0	0	0	0	0	1	SAH - RT TENTORIAL REGION	0	C	D
419	RAJA	27	M	17108	FALL	0	1	0	0	0	1	1	1	1	FRACTURE - RT FRONTAL BO	1	C	D

420	KUNJAMMAL	50	F	17111	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
421	SIVA	32	M	17112	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT OCCIPITAL I	0	C	D
422	KOKILA	65	F	17118	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORO F	0	C	D
423	MANICKAM	48	M	17136	RTA	1	1	0	0	1	0	0	0	1	EDH - RT TRMPORAL POLAR I	0	C	D
424	SIVAKANNU	32	M	17163	RTA	0	1	1	0	1	0	0	0	1	SDH - LT FRONTOPARIETAL	0	C	D
425	MURUGESAN	38	M	17172	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - LT PARIETAL BC	0	C	D
426	BALAMURUG	18	M	17177	FALL	1	1	0	0	0	0	0	0	1	FRACTURE - RT ZMC	0	C	D
427	SUBRAMANI	40	M	17178	RTA	0	1	1	0	0	0	0	0	1	SAH - RT SYLVIAN REGION	0	C	D
428	VIJAYAKUMA	38	M	17189	RTA	0	1	1	0	1	0	0	0	1	CONTUSION - RT GC REGION	0	C	D
429	RAVINDRAN	21	M	17201	ASSAULT	1	1	0	0	0	0	0	1	1	FRACTURE - RT FRONTAL BOI	0	C	D
430	SENTHAMAR	39	F	17208	ASSAULT	0	1	0	0	0	1	1	1	1	FRACTURE - LT TEMPOROPA	1	C	D
431	SURENDRAN	50	M	17212	FALL	0	1	1	0	0	0	0	0	1	SAH - TENTORIAL BLEED	0	C	D
432	MURUGAN	42	M	17220	FALL	0	1	1	0	1	0	0	0	1	FRACTURE - LT FRONTAL BO	1	C	D
433	RAJESWARI	20	F	17223	FALL	1	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	0	C	D
434	JAYARANI	45	F	17225	RTA	0	0	1	0	1	0	0	0	1	CONTUSION - LT FRONTAL RI	0	C	D
435	MARI	55	M	17229	FALL	0	0	1	0	0	0	0	0	1	SDH - THIN - RT FRONTOTEM	0	C	D
436	SARANGAPA	32	M	17322	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT FRONTAL BO	0	C	D
437	MANIVANNAI	26	M	17323	ASSAULT	0	1	0	0	0	1	0	1	1	FRACTURE - LT FRONTAL CO	1	S	D
438	VENKATESAI	45	M	17335	RTA	0	1	0	0	0	1	1	1	1	FRACTURE - BASE OF SKULL	1	S	D
439	SUBRAMANI	50	M	17329	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - LT MAXILLA	0	C	D
440	PADMAVATH	50	F	17383	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL R	0	C	D
441	SELVAM	35	M	17403	FALL	0	1	0	0	1	0	0	0	1	EDH - RT TEMPORAL REGION	0	C	D
442	JANAGARATI	36	M	17427	RTA	0	1	0	0	0	0	0	0	1	FRACTURE - RT FRONTAL BO	0	C	D
443	SUBRAMANI	75	M	17429	FALL	0	1	1	0	0	0	0	0	1	SDH - THIN - RT FRONTOTEM	0	C	D
444	NAVANEETH.	30	M	17440	RTA	0	1	0	0	1	0	0	0	1	EDH - RT TEMPORAL REGION	0	C	D
445	MUNUSAMY	39	M	17448	RTA	1	1	0	0	1	0	0	0	1	EDH - RT TEMPOROL REGION	0	C	D
446	DESAMMAL	50	F	17453	FALL	0	1	1	0	1	0	0	0	1	CONTUSION - RT TEMPORAL	1	C	D
447	YUVARAJ	22	M	17457	FALL	0	0	1	0	1	0	0	0	1	CONTUSION - RT FRONTAL R	0	C	D
448	PRADEEP	29	M	17458	RTA	0	1	0	0	0	1	0	1	1	FRACTURE - BASE OF SKULL	1	S	D
449	RAMANATHA	50	M	17460	RTA	0	1	0	0	1	0	0	0	1	EDH - RT TEMPOROPARIETAL	0	C	D
450	SEKAR	44	M	17472	FALL	0	1	0	0	0	0	0	0	1	FRACTURE - RT OCCIPITAL B	0	C	D
451	ANAND	19	M	17485	RTA	1	1	0	0	0	0	0	0	1	FRACTURE - LT TEMPORAL B	0	C	D
452	ELUMALAI	73	M	17496	RTA	0	1	1	0	0	0	0	0	1	SDH - RT FRONTOTEMPORAL	0	C	D
453	SAROJA	59	F	17519	FALL	0	1	0	0	0	0	0	0	1	SAH - INTERHEMISPHERIC RE	0	C	D
454	AFSARAHMD	60	M	17545	RTA	0	1	1	0	1	0	0	0	1	SDH - RT FRONTOTEMPORAL	0	C	D
455	CHINNADURA	25	M	17578	RTA	0	1	0	0	1	0	0	0	1	EDH - RT TEMPORAL POLAR I	0	C	D

APPENDIX

INFORMATION SHEET

We are conducting study on **"ANALYSIS OF HEAD INJURY PATIENTS WITH GCS 15"**

among patients attending Rajiv Gandhi Government General Hospital, Chennai and for that your specimen may be valuable to us.

- The purpose of this study is to analyze the head injury patients with GCS 15.
- We are selecting certain cases and if your radiological image is found eligible, we may be using your specimen to perform extra tests and special studies which in any way do not affect your final report or management.
- The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.
- Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.
- The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of investigator Signature of participant

Date:

INFORMED CONSENT FORM

"ANALYSIS OF HEAD INJURY PATIENTS WITH GCS 15"

I _____ have read the information in this form (or it has been read to me). I was free to ask any questions and they have been answered. I am over 18 years of age and, exercising my free power of choice, hereby give my consent to be included as a participant in **"ANALYSIS OF HEAD INJURY PATIENTS WITH GCS 15"**. I have read and understood this consent form and the information provided to me.

2. I have had the consent document explained to me.

3. I have been explained about the nature of the study.

4. I have been explained about my rights and responsibilities by the investigator.

5. . I am aware that I may need to undergo a CT scan for this study.

7. I agree that my records can be used for research and study purposes.

8. I am aware of the fact that I can opt out of the study at any time without having to give any reason and this will not affect my future treatment in this hospital. *

9. I am also aware that the investigator may terminate my participation in the study at any time, for any reason, without my consent. *

10. I hereby give permission to the investigators to release the information obtained from me as result of participation in this study to the sponsors, regulatory authorities, Govt. agencies, and IEC. I understand that they are publicly presented.

11. I have understand that my identity will be kept confidential if my data are publicly presented

12. I have had my questions answered to my satisfaction.

13. I have decided to be in the research study.

I am aware that if I have any question during this study, I should contact the investigator. By signing this consent form I attest that the information given in this document has been clearly explained to me and understood by me, I will be given a copy of this consent document.

Name _____

Date_____ Signature_____

Name and Signature of impartial witness (required for illiterate patients):

Name_____

Date_____ Signature_____

Name and Signature of the investigator obtaining consent:

Name_____

Date_____ Signature_____

ஆராய்ச்சி ஒப்புதல் கடிதம்

ஆராய்ச்சி தலைப்பு "கிலாஸ்கோ கோமா அளவு 15 உடைய தலை காய நோயாளிகள் பற்றிய பகுப்பாய்வு"

ராஜீவ் காந்தி அரசு மருத்துவக்கல்லூரி மற்றும் அரசு பொது மருத்துவமனையின் நரம்பியல் அறுவை சிகிச்சைத் துறையில் **"கிலாஸ்கோ கோமா அளவு 15 உடைய தலை காய நோயாளிகள் பற்றிய பகுப்பாய்வு"** பற்றிய ஆய்வு நடைபெறுகிறது என்பதை அறிந்து கொண்டேன்

- எனக்கு18 வயது பூர்த்தி அடைந்து விட்டது என்றும் என் சொந்த விருப்பத்தின் பெயரில் இந்த ஆராய்ச்சியில் பங்கு பெறுகிறேன் என்று தெரிவித்து கொள்கிறேன்.
- இந்த ஆராய்ச்சிபற்றி நான் முழுமையாக அறிந்து கொண்டேன் எனக்கு உள்ள உரிமைகள் பற்றி அறிந்து கொண்டேன்.
- இந்த ஆராய்ச்சிக்காக நான் சிடி ஸ்கேன் எடுக்க வேண்டி வரும் என்பதை அறிந்து கொண்டேன்
- சிடி ஸ்கேன், மற்றும் எம்.ஆர்.ஐ ஸ்கேன் ஆகியவற்றின் அடிப்படையில் இந்த ஆய்வு நடைபெறுகிறது என்பதையும் மேலும் அறுவை சிகிச்சையின் போது நேரடியாக பார்க்கப்படுவதை வைத்தும் ஆய்வு நடைபெறுகிறது என்பதையும் அறிந்து கொண்டேன்
- இவ்வாய்வில் கலந்து கொள்பவர்களின் சொந்த தகவல்கள் ரகசியமாக பாதுக்காகபடும் என்பதையும் இந்த ஆய்வின் முடிவுகளை பிரசுரிக்குபோது

அல்லது வெளியிடும்போதோ தங்களின் எனது தகவல்கள் ஏதும் வெளியிடபடாது என்பதையும் அறிந்து கொண்டேன்

- இந்த ஆராய்ச்சியிலிருந்து எந்த நேரமும் பின் வாங்கலாம் என்றும், அதனால் எந்த பாதிப்பும் எற்படாது என்பதையும் அறிந்து கொண்டேன்
- இந்த ஆய்வில் பங்குபெற அல்லது விலகிக்கொள்ள எனக்கு முழு சுதந்திரம் உண்டு என்பதையும், இந்த ஆய்வில் இருந்து நான் விலகிகொண்டாலும் எனக்கு கிடைக்கவேண்டிய சிகிச்சை தொடர்ந்து கிடைக்கும் என்பதையும் அறிந்து கொண்டேன்
- இந்த ஆராய்ச்சியின் விவரங்களும், அதன் நோக்கங்களும் எனக்கு தெளிவாக விளக்கப்பட்டது. எனக்கு விளக்கப்பட்ட விவரங்களை புரிந்து கொண்டு, இந்த ஆய்வில் கலந்து கொள்ள சம்மதிக்கிறேன்
- இந்த ஆராய்ச்சியில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின் பேரில் தான் பங்கு பெறுகிறேன்

----------கையொப்பம்

தேதி ---------- ----------பெயர்

----------சாட்சி கையொப்பம்

தேதி ---------- ----------பெயர்

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI -3

Telephone No : 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To

Dr.H.Chelladurai Pandian,
Post Graduate in Neurosurgery,
Madras Medical College,
Chennai -3

Dear Dr.CH.Chelladurai Pandian,

The Institutional Ethics committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled " Analysis of Head injury patients with GCS 15" " No.35022013.

The following members of Ethics Committee were present in the meeting held on 05.02.2013 conducted at Madras Medical College, Chennai -3.

1.	Dr.SivaKumar, MS FICS FAIS	--- Chairperson
2.	Prof. R. Nandhini MD Director, Instt. of Pharmacology ,MMC, Ch-3	-- Member Secretary
3.	Prof. Shyamraj MD Director i/c , Instt. of Biochemistry , MMC, Ch-3	-- Member
4.	Prof. P. Karkuzhali. MD Prof., Instt. of Pathology, MMC, Ch-3	-- Member
5.	Prof. A. Radhakrishnan MD Prof of Internal Medicine, MMC, Ch-3	-- Member
6.	Prof. S. Deivanayagam MS Prof of Surgery, MMC, Ch-3	-- Member
7.	Thiru. S. Govindsamy. BABL	-- Lawyer
8.	Tmt. Arnold Soulina MA MSW	-- Social Scientist

We approve the proposal to be conducted in its presented form.

Sd/ Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

R Nadini 7/3/13

Member Secretary, Ethics Committee

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Analysis of head injury patients with gcs 15
by Chelladurai Pandian Hariharan
18101503 M.Ch. Neuro Surgery

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